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TIERRA SOLUTIONS, INC. SM

Transmitted Via Electronic Mail & Regular Mail

July 9, 2015

Emergency and Remedial Response Division
U.S. Environmental Protection Agency, Region 2
290 Broadway, 19th Floor
New York, New York 10007-1866
Attention: Ms. Stephanie Vaughn, Remedial Project Manager

U.S. Environmental Protection Agency
2890 Woodbridge Avenue
Edison, New Jersey 08837
Attn: Lower Passaic River Study Area On-Scene Coordinator

Re: Report on the Pipeline Probing Survey at RM10.9 – Revised July 8, 2015
Unilateral Administrative Order – CERCLA Docket No. 02-2012-2020
Lower Passaic River Study Area River Mile 10.9 Time Critical Removal Action

Dear Ms. Vaughn and On-Scene Coordinator:

Tierra Solutions, Inc. (Tierra) has revised the above referenced report to address the review comments from CDM Smith dated June 16, 2015. The revised report is attached.

If you have any questions regarding the work or the report, please contact me at 732.246.5851.

Sincerely,

Paul S. Brzozowski, PE
Remediation Manager
On behalf of Occidental Chemical Corporation
(as successor to Diamond Shamrock Chemicals Company)

Enclosures

cc: Office of Regional Counsel
U.S. Environmental Protection Agency, Region 2
290 Broadway, 17th Floor
New York, New York 10007-1866
Attn: Lower Passaic River Study Area Site Attorney – Sarah Flanagan

New Jersey Department of Environmental Protection
Site Remediation Program
401 E. State Street
P.O. Box 028
Trenton, New Jersey 08265-0028
Attn: Lower Passaic River Study Area Project Manager – Jay Nickerson

MARINE AND FRESHWATER
SURVEY SERVICES

OCEAN SURVEYS, INC.
129 MILL ROCK ROAD EAST
OLD SAYBROOK, CT 06475

TEL. (860) 388-4631 FAX (860) 388-5879
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8 July 2015

Mr. Paul Brzozowski
Tierra Solutions, Inc.
2 Tower Center Blvd., 10th Floor
East Brunswick, NJ 08816

SUBJECT: SEDIMENT PROBING
(OSI REPORT NO. 14ES056)
SUBMARINE PIPELINE CROSSINGS
RM10.9 PASSAIC RIVER, LYNDHURST, NJ

REFERENCES: A - "Quality Assurance Project Plan for River Mile 10.9 Pipeline Probing Survey", November 2014, Revision1 with SOPs 1, 2, and 3, September 2014, Revision 0

ATTACHMENTS: Attachment 1 – Daily Field Logs
Attachment 2 – Final Probe Tally
Attachment 3 – Survey Control Network and Daily Navigation Checks
Attachment 4 – Sediment Probing Results

Dear Mr. Brzozowski:

Ocean Surveys (OSI) is pleased to submit this report documenting a sediment probing investigation performed on the Lower Passaic River in Lyndhurst, NJ in the vicinity of the RM 10.9 Removal Area (Figure 1). The object of the probing investigation was to obtain data to identify the horizontal and vertical location of two submarine pipelines that could impact potential future sediment removal/remediation operations in the area.

Summary of Field Investigation and Equipment

The field work for the sediment probing program was performed in two mobilizations surrounding the Christmas and New Year holidays and within favorable tide windows. The first mobilization fell between 08 and 17 December 2014; the second mobilization fell between 22 and 25 January 2015. Daily logs of field operations for each mobilization are provided in Attachment 1.

The initial scope of work outlined in Reference A required the probing of 24 transects (12 on each pipeline alignment) with a minimum of 9 probes on each transect (a minimum total of 216 probes). Based on the results presented after the first mobilization of December 2014, Tierra coordinated with the USEPA regarding the data; as a result of such coordination the scope of work was modified for the second mobilization. The specific deviations from the original scope which were granted are included as part of Attachment 2.

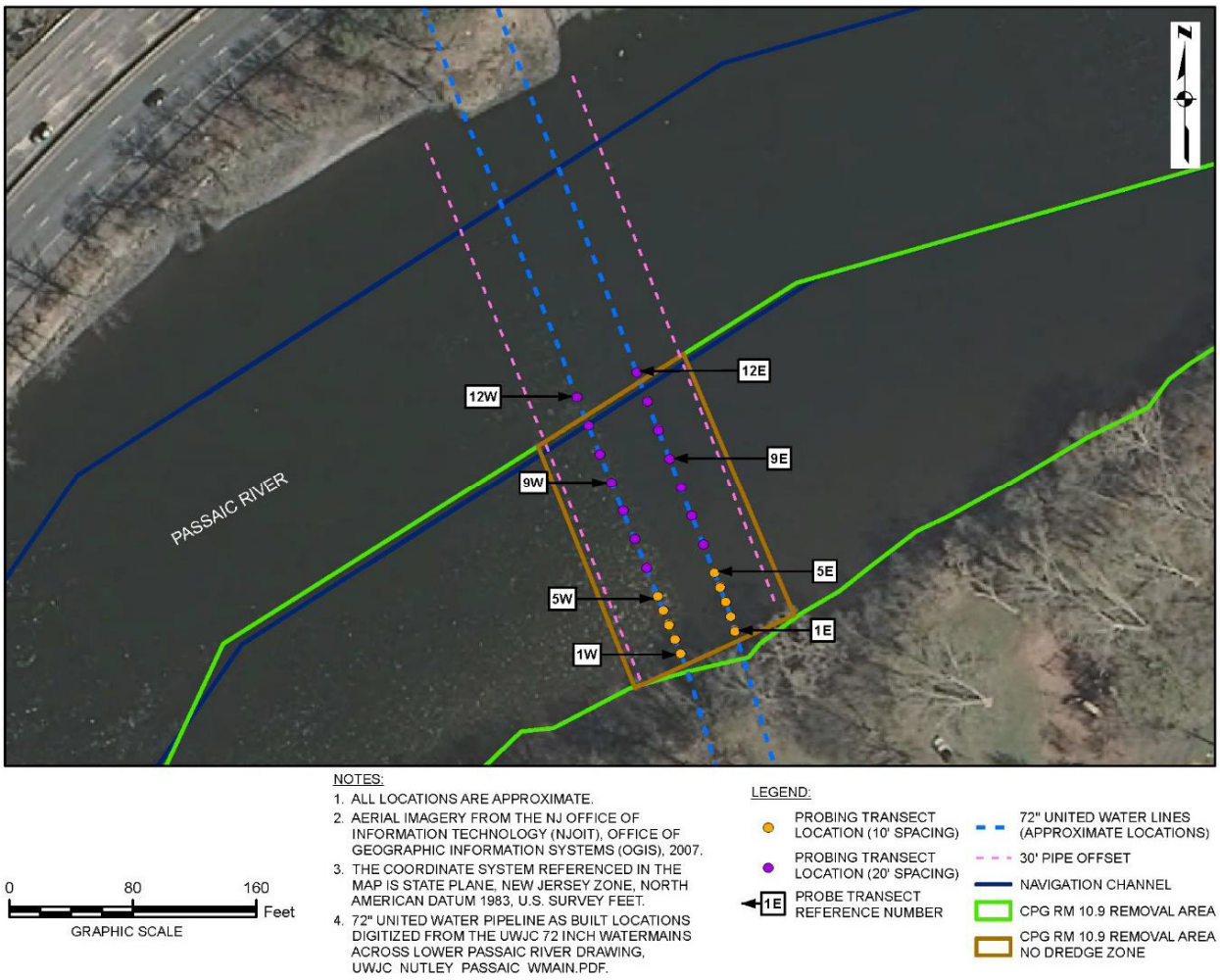


Figure 1. Site Location map showing approximate position of submarine pipelines and probing transect locations (from Ref. A).

Field operations were conducted by a two-person OSI field crew working from a 32-foot, shallow draft pontoon vessel with a central moon-pool, a 3-point anchoring system, a hydraulic A-frame and lifting gear appropriate to the task. The vessel was outfitted with the following equipment and instrumentation:

- Trimble RTK GPS Positioning System
- HYPACK navigation and data-logging computer system
- OSI jet-probing system

Survey coordinates were recorded in feet and were referenced horizontally to the New Jersey State Plane Coordinate System (2900), NAD83 and vertically to NGVD 29. Positioning and positioning checks were conducted in accordance with SOP No. 3, “Positioning”, as documented in the QAPP. Table 1 lists the control points utilized for this survey which were provided to OSI

by DPK Consulting via Tierra (see "GPS Control" plan view in Attachment 3). Before commencing probing operations, OSI checked the RTK GPS base installation to the local control network. Once the initial base station installation was checked to the control network, twice daily checks were performed to the control point "IRON BAR C". The results of these daily navigation checks are listed in Attachment 3.

Control Point ID	Published Coordinates			Comment
	Easting (ft)	Northing (ft)	Elevation (ft)	
MAG NAIL 'A'	593586.35	723347.55	7.07	
IRON BAR 'B'	593654.32	723304.73	11.38	RTK Base
IRON BAR 'C'	593603.47	723248.24	10.87	Daily check point
IRON BAR 'D'	593224.84	722876.36	8.51	

Table 1. Coordinates provided are in the New Jersey NAD83 State Plane Coordinate System and are in U.S. Survey Feet. Elevations are in feet and referenced to NGVD 29.

Sediment probing was conducted with an OSI jet probing system in accordance with Reference A. The system uses a high-pressure jet (≈150 psi) of water passing through a ¾" steel probe pipe to displace and loosen sediment as the probe advances. Vessel positioning and the determination of as-probed locations were accomplished utilizing the navigation system listed above. Upon anchoring over a probe location, OSI recorded the time, position (in project X, Y coordinates) and the water depth. Water depth at each probe location was measured using either a lead line or sounding pole.

Initially the probe was manually lowered to the riverbed and allowed to penetrate the overlying sediment under the weight of the probe. Once the probe reached refusal under its own weight it was advanced slowly by hand using both horizontal and vertical movements to promote penetration. Only after the probe penetrated approximately two feet into the sediment was the water jet brought online to promote further penetration. At no time was the probe hammered or otherwise driven into the bottom. The probe operators advanced the probe into the riverbed until contact with the apparent pipe (or armor) was made or other refusal was reached. Upon refusal, total probe penetration was recorded. This value was later related to water surface elevation (via RTK GPS) and water depth to yield a final elevation at the point of refusal.

Data Products

The data set acquired during the probing operations at RM 10.9 was processed and reviewed at OSI's headquarters in Old Saybrook, CT. Data from each probing transect was developed into an elevation profile showing riverbed elevation and the elevation of refusal for each probe. Based on these elevation profiles, an interpreted "crown of pipe" was identified. The data for all transects was then compiled and presented in three formats.

1) A plan view drawing at a scale of 1"=50' that shows the position of individual probes as well as the interpreted pipeline alignments for each pipe. This plan view drawing is supplemented with data from a terrestrial Ground Penetrating Radar (GPR) survey performed by the University of Illinois in August of 2014 and provided to OSI via Tierra.
2) Profile views of riverbed elevation and pipe elevation along the interpreted crown of pipe alignment for each pipe. These profiles are also supplemented with the August 2014 GPR data.
3) Profile views of individual probing transects showing riverbed elevation, elevation of refusal for each probe, a basic description accompanying the probe elevation (e.g. "Refusal, hard packed sand"), and the interpreted crown of pipe for each transect.

The full data set is presented in the formats described above in Attachment 4.

Discussion of Results

Of the original scope of 24 transects, elevation profiles are presented for 18 transects. Of those, the data collected on three near-shore transects proved inconclusive due to the presence of subbottom interferences (rocks) or refusal due to hard packed sand which prevented further penetration. These transects were 1E, 2E, and 2W. The remaining transects show consistent results in which pipe/armor elevations were detected in the vicinity of the expected pipe alignment (i.e. hard refusal was detected in a consistent profile). A finding of no-refusal or deep refusal in hard packed sand on either side of the expected pipe alignment provided the bounds for each profile. The probing results from this study and the GPR data from August 2014 appear to agree well, though there is a gap between the two data sets in the near-shore area.

We at OSI appreciate the opportunity to support Tierra Solutions on this project and look forward to continuing this relationship in the future. If you have any questions regarding any aspect of this survey, or if we can be of service in any other capacity, please do not hesitate to call.

Sincerely,

OCEAN SURVEYS, INC.

John R. Bean
Project Manager

JRB/lf
Attachments

ATTACHMENT 1

DAILY FIELD LOGS

List of OSI onsite personnel

Name	Initials
Alexander G. Unrein	AGU
Curt L. Ramsey	CLR
Jason B DeLorenzo	JBD
John R. Bean	JRB

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 8, 2014 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Brian Mikucki (Rep. of TSI)

OSI Personnel: AGU, JBD

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	14:49	**Temp (F)**	29
9:08	21:48	3:44	16:26	**Wind**	NE5-10	**Sky**	Overcast
				Sea	calm		

Transects Surveyed: n/a **Number of locations surveyed:** n/a

Time	Activity
9:45	Arrive at ramp in Kearny, NJ. Prepare and launch Wildu. JBD brings boat and AGU brings trailer to CPG.
11:15	Meet at CPG site. Secure trailer and Wildu.
12:25	Arrive at Lyndhurst Community Center park. Meet Brian at park. Recover control and setup RTK base station.
13:35	Perform initial navigation checks to control points 'Mag Nail A', 'Iron Bar C', and 'Iron Bar D'.
14:50	Set marker stakes on shore over anticipated center lines for each pipe.
15:25	Establish a project TBM control point at the Nutley Bridge boat ramp on the west side of the river near the water's edge. Brian departs site.
15:45	Perform end of day nav check at Iron Bar C, then breakdown base station.
16:05	Arrive back at CPG dock. Continue boat setup.
17:00	Finish at dock, end of day.

Ops. Days: 0.725

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 9, 2014 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Cliff Firstenberg (Rep. of TSI)
OSI Personnel: AGU, JBD Pat Connelly (Rep. of CDM Smith on behalf of EPA)

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	7:30	**Temp (F)**	35
9:53	22:38	4:26	17:08	**Wind**	N10-15	**Sky**	Rain
				Sea	calm		

Transects Surveyed: n/a **Number of locations surveyed:** n/a

Time	Activity
7:30	Meet with Cliff at CPG. Weather conditions are unsuitable to work in and expected to worsen throughout day. Discuss weather conditions, project tasks, and health and safety. Pat checks in with crew.
8:40	Depart CPG.

Standby Days: 1.0

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 10, 2014 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Brian Mikucki (Rep. of TSI)
OSI Personnel: AGU, JBD Pat Connelly (Rep. of CDM Smith on behalf of EPA)

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*	
Early	**Late**	**Early**	**Late**
10:39	23:29	5:07	17:50

Weather			
Time	8:33	**Temp (F)**	38
Wind	NW10-15	**Sky**	Overcast
Sea	calm		

Transects Surveyed: 1E, 10E **Number of locations surveyed:** 17

Time	Activity
6:55	Arrive at park, setup base station.
7:20	Perform nav check to Iron Bar C.
7:40	Arrive at CPG, setup boat. Meet Brian and Pat.
8:35	Conduct daily safety meeting.
8:50	Depart dock.
9:26	Arrive at ramp. Nav check to NUTRAMP14.
9:47	Establish new control point NUTBRIDGE14
10:00	Perform boat nav and water level checks to NUTBRIDGE14.
10:36	On first station, begin probing.
14:39	Probing pipe clogged with sediment. Unable to clear pipe with pump, will need mechanical means.
14:55	Perform PM water level and boat nav check.
15:34	Back at dock, breakdown and secure boat. Backup data.
16:04	Depart CPG.
16:14	Arrive at base station. Perform PM nav check to Iron Bar C. Breakdown base.
16:35	Depart base location for hardware store to buy supplies to unclog pipe.
17:19	Back at CPG.
17:45	Finish unclogging pipe. Depart. CPG. End of day.

Ops. Days: 1.0

Overtime (hrs): 0.75

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 11, 2014 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Brian Mikucki (Rep. of TSI)
Cliff Firstenberg (Rep. of TSI)
Pat Connelly (Rep. of CDM Smith on behalf of EPA)

OSI Personnel: AGU, JBD

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	9:25	**Temp (F)**	32
11:26	n/a	5:48	18:33	**Wind**	W5-10	**Sky**	P. Cloudy
				Sea	calm		

Transects Surveyed: 1E, 2E, 10E **Number of locations surveyed:** 18

Time	Activity
6:55	Arrive at park. Setup base station.
7:07	Perform AM Nav check.
7:25	Arrive at CPG. Load and setup boat. Meet Pat.
8:01	Brian arrives, conduct daily safety meeting.
8:12	Depart Dock.
8:44	Perform AM vessel nav and water level checks.
9:00	Thaw anchor lines.
9:24	On first station.
10:57	Broke threads on first section of pipe. Retrieve gear and repair.
11:10	Cliff stops by and observes from shore.
11:17	Finish repair of pipe continue probing.
15:13	Finish probing. Retrieve anchors. Clean deck.
15:24	Perform PM boat nav and water level checks.
15:59	Back at dock. Secure boat, backup data.
16:30	Depart CPG.
16:45	Perform PM navigation check. Breakdown base station.
16:59	End of day.

Ops. Days: 1.0

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 12, 2014 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Carlie Thompson (Rep. of TSI)
OSI Personnel: AGU, JBD, CLR Pat Connelly (Rep. of CDM Smith on behalf of EPA)

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	14:26	**Temp (F)**	35
0:17	12:13	6:33	19:21	**Wind**	W5	**Sky**	P. Cloudy
				Sea	calm		

Transects Surveyed: 2E, 6E, 9E **Number of locations surveyed:** 10

Time	Activity
6:50	Arrive at park. Setup base station.
7:08	Perform AM navigation check.
7:35	Arrive at CPG. Setup boat. Meet Pat.
8:22	Carlie arrives, conduct daily safety meeting.
8:30	Depart dock.
9:05	Pickup Curt at Ramp.
9:09	Perform boat nav and water level checks. Brief Curt on daily safety.
9:23	Cliff Oks removing the Hale pumps from the project. Jay to bring home today.
9:27	De-ice anchor lines.
13:08	Move to deeper water, drop Jay off at ramp.
15:08	Finish probing. Retrieve anchors. Clean deck.
15:26	Perform PM boat nav and water level checks.
16:03	Back at dock. Secure boat, backup data.
16:30	Depart CPG.
16:45	Perform PM navigation check. Breakdown base station.
17:00	End of day.

Ops. Days: 1.0

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 13, 2014 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Brian Mikucki (Rep. of TSI)
Pat Connelly (Rep. of CDM Smith on behalf of EPA)

OSI Personnel: AGU, CLR

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	11:34	**Temp (F)**	39
1:03	12:57	7:28	20:15	**Wind**	W5	**Sky**	P. cloudy
				Sea	calm		

Transects Surveyed: 8E, 9E **Number of locations surveyed:** 13

Time	Activity
7:05	Arrive at park. Setup base station.
7:20	Perform AM navigation check.
7:40	Arrive at CPG. Setup boat. Meet Pat and Brian.
8:00	Conduct daily safety meeting. Depart dock.
8:39	Perform boat navigation and water level checks. De-ice lines, setup pump.
9:10	On first station. Begin probing.
14:49	Attempted to setup on station 11E+0. Strong winds causing too much motion to stay on station. Retrieve anchors.
15:12	Perform PM boat nav and water level checks.
15:50	Back at dock. Secure boat, backup data. Discuss progress and scheduling with Brian.
16:10	Depart CPG.
16:22	Perform PM navigation check. Breakdown base station.
16:45	End of day.

Ops. Days: 1.0

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 14, 2014

OSI Job #: 14ES056

Project Title/Client: Tierra Solutions, Inc.

Visitors: Abhi Acharya (Rep. of TSI)
Pat Connelly (Rep. of CDM Smith on behalf of EPA)

OSI Personnel: AGU, CLR

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	12:33	**Temp (F)**	42
1:49	13:43	8:34	21:10	**Wind**	NW5-10	**Sky**	Overcast
				Sea	calm		

Transects Surveyed: 7E, 11E

Number of locations surveyed: 17

Time	Activity
6:55	Arrive at park. Setup base station.
7:08	Perform AM navigation check.
7:30	Arrive at CPG. Setup boat. Meet Pat.
7:40	Abhi arrives.
7:50	Conduct daily safety meeting.
8:10	Depart dock.
8:46	Perform boat navigation and water level checks.
9:19	Setup on first station. Begin probing.
10:25	Touch up markings on pipe.
14:50	Discuss status with Pat and Abhi, both confirm we are done with transect 7. Not enough time to reset anchors for new location. Retrieve anchors, wash down deck.
15:18	Perform PM boat nav and water level checks.
15:49	Lower A-frame to make it under bridge.
16:01	Back at dock. Raise A-frame. Secure boat. Backup data.
16:30	Depart CPG.
16:42	Perform PM navigation check. Breakdown base station.
16:55	End of day.

Ops. Days: 1.0

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 15, 2014 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Brian Mikucki (Rep. of TSI)
OSI Personnel: AGU, CLR Pat Connelly (Rep. of CDM Smith on behalf of EPA)

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	8:45	**Temp (F)**	41
2:35	14:32	9:37	22:01	**Wind**	L&V	**Sky**	Sunny
				Sea	calm		

Transects Surveyed: 3E, 5E, 11E, 12E **Number of locations surveyed:** 15

Time	Activity
7:03	Arrive at park. Setup base station.
7:19	Perform AM navigation check.
7:30	Arrive at CPG. Setup boat. Meet Pat.
7:55	Brian arrives, conduct daily safety meeting.
8:05	Depart dock.
8:39	Perform boat navigation and water level checks.
8:45	De-ice anchor lines.
9:13	Setup on first station. Begin probing.
13:56	Retrieve anchors for shore break.
14:20	Continue probing.
14:54	End probing, retrieve anchors, wash down deck.
15:07	Perform PM boat nav and water level checks.
15:50	Back at dock. Secure boat. Discuss scheduling with Brian.
16:28	Perform PM navigation check. Breakdown base station. Backup data.
16:55	End of day.

Ops. Days: 1.0

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 16, 2014 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Brian Mikucki (Rep. of TSI)
Pat Connelly (Rep. of CDM Smith on behalf of EPA)

OSI Personnel: AGU, CLR

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	10:12	**Temp (F)**	40
3:25	15:29	10:33	22:49	**Wind**	L&V	**Sky**	Overcast
				Sea	calm		

Transects Surveyed: 2W, 10W **Number of locations surveyed:** 15

Time	Activity
6:55	Arrive at park. Setup base station.
7:12	Perform AM navigation check.
7:30	Arrive at CPG. Setup boat. Meet Pat.
7:52	Depart dock.
8:24	Pickup Brian at ramp.
8:28	Perform boat navigation and water level checks.
8:31	Conduct daily safety meeting.
8:50	Create west pipe line plan. Brian approves.
9:15	Setup on first station. Begin probing.
13:22	Drop Brian at ramp.
14:40	Brian hooks up anchor lines on shore. Setup on station.
15:16	Pickup anchors. Drop Pat off with Brian on shore.
15:31	Perform PM boat nav and water level checks.
16:15	Back at dock. Secure boat.
16:30	Depart CPG.
16:41	Perform PM navigation check. Breakdown base station. Backup data.
16:55	End of day.

Ops. Days: 1.0

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 17, 2014 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Brian Mikucki (Rep. of TSI)
Pat Connelly (Rep. of CDM Smith on behalf of EPA)

OSI Personnel: AGU, CLR

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	14:58	**Temp (F)**	48
4:16	16:30	11:24	23:35	**Wind**	W5	**Sky**	M. Sunny
				Sea	Calm		

Transects Surveyed: 11W, 12W **Number of locations surveyed:** 24

Time	Activity
7:00	Arrive at park. Setup base station.
7:19	Perform AM navigation check.
7:40	Arrive at CPG. Setup boat. Meet Pat.
8:00	Depart dock.
8:33	Pick Brian up at ramp.
8:33	Perform boat navigation and water level checks.
8:35	Conduct daily safety meeting.
9:00	Setup on first station. Begin probing.
15:05	End probing, retrieve anchors, wash down deck.
15:24	Drop Brian and Pat off at ramp.
15:28	Perform PM boat nav and water level checks.
16:04	Back at dock. Secure boat.
16:15	Depart CPG.
16:30	Perform PM navigation check. Breakdown base station. Backup data.
16:50	End of day.

Ops. Days: 1.0

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: December 18, 2014 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** n/a

OSI Personnel: AGU, CLR

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	12:00	**Temp (F)**	40
5:06	17:25	12:13	n/a	**Wind**	W10-15	**Sky**	P. Sunny
				Sea	calm		

Transects Surveyed: n/a **Number of locations surveyed:** n/a

Time	Activity
11:15	Arrive at CPG. Prepare boat for travel. Conduct daily safety meeting.
11:50	Depart dock.
14:19	Arrive at Bayonne ramp, meet Joe and Kevin. Tide still too low to pull boat.
15:15	Pull boat and prepare for travel.
16:15	Depart for OSI.

Ops. Days: 0.5

OSI Project Manager: **Alexander Unrein**

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: January 21, 2015 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Brian Mikucki (Rep. of TSI)

OSI Personnel: JRB, CLR

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*	
Early	**Late**	**Early**	**Late**
8:33	21:04	3:16	15:52

Weather			
Time	12:00	**Temp (F)**	25
Wind	calm	**Sky**	P. Sunny
Sea	calm		

Transects Surveyed: n/a **Number of locations surveyed:** n/a

Time	Activity
7:55	Arrive at ramp. Safety meeting. Launch Will Du.
9:30	Meet at CPG dock, setup boat.
12:05	Head to base station site in park. Scheduled to meet with Brian after 12:30.
12:28	Set up Base station.
12:45	Rover nav check to Iron Bar C.
14:04	Finish meeting with Brian; head back to boat.
14:16	At CPG prepping for underway.
14:21	Underway.
14:56	Boat nav check and water level.
15:39	Moored CPG.
15:42	Boat secured. Depart CPG dock.
15:56	At park to recover base station.
16:10	End of day.

Ops. Days: 0.8

OSI Project Manager: _____

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: January 22, 2015

OSI Job #: 14ES056

Project Title/Client: Tierra Solutions, Inc.

Visitors: Brian Mikucki (Rep. of TSI)
Pat Connelly (Rep. of CDM Smith on behalf of EPA)

OSI Personnel: JRB, CLR

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	12:14	**Temp (F)**	30
9:25	21:58	4:05	16:38	**Wind**	W5	**Sky**	overcast
				Sea	calm		

Transects Surveyed: 3E, 5E, 12E

Number of locations surveyed: 17

Time	Activity
5:55	At park to setup base station.
6:18	AM nav check.
6:35	At CPG prepping for underway.
7:16	Underway.
7:43	Pick up Brian and Pat at Nutley Ramp.
7:55	Safety meeting.
8:01	Boat nav check and water level.
8:55	Anchored over first probe location; begin probing.
12:12	Haul up anchors; move off flats; tide falling.
12:50	Anchored over transect 12E.
13:48	Suspend probing for the day; hauling anchors.
14:02	Drop off Brian and Pat at Nutley Ramp.
14:11	Boat nav check and water level.
14:47	Moored CPG.
15:05	Boat secured. Depart CPG.
15:14	At park to perform PM nav check.
15:25	Break down base station.
15:35	Recover mooring line on shore.
15:55	Fuel truck and cans; end of day.

Ops. Days: 1.0

OSI Project Manager: _____

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: January 23, 2015 **OSI Job #:** 14ES056

Project Title/Client: Tierra Solutions, Inc. **Visitors:** Brian Mikucki (Rep. of TSI)
Pat Connelly (Rep. of CDM Smith on behalf of EPA)

OSI Personnel: JRB, CLR

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	11:18	**Temp (F)**	30
10:20	22:54	4:55	17:25	**Wind**	calm	**Sky**	clear
				Sea	calm		

Transects Surveyed: 3W, 6W **Number of locations surveyed:** 18

Time	Activity
5:45	At park to setup base station.
6:17	AM nav check.
6:45	At CPG prepping for underway.
7:01	Underway.
7:35	Pick up Brian and Pat at Nutley Ramp.
7:46	Safety meeting.
7:51	Boat nav check and water level.
8:48	Anchored over first probe location; begin probing.
12:39	Haul up anchors; suspend probing for the day; tide falling.
13:02	Boat nav check and water level.
13:07	Drop off Brian and Pat at Nutley Ramp.
13:48	Moored CPG.
14:12	Boat secured. Depart CPG.
14:23	At park to perform PM nav check.
14:29	Break down base station.
14:45	End of day.

Ops. Days: 0.9

OSI Project Manager: _____

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: January 24, 2015

OSI Job #: 14ES056

Project Title/Client: Tierra Solutions, Inc.

Visitors: Brian Mikucki (Rep. of TSI)
Pat Connelly (Rep. of CDM Smith on behalf of EPA)

OSI Personnel: JRB, CLR

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	11:34	**Temp (F)**	33
11:17	23:51	5:47	18:14	**Wind**	E 5	**Sky**	overcast
				Sea	calm		

Transects Surveyed: 5W, 6W, 8W

Number of locations surveyed: 18

Time	Activity
6:15	At CPG to shovel snow (4 inches) off dock and boat.
7:24	Talk to Brian; we agree to give it a try; mostly rain now; temps in 30's.
7:30	At park to setup base station.
7:54	AM nav check.
8:13	At CPG prepping for underway.
8:28	Underway.
9:05	Pick up Brian and Pat at Nutley Ramp.
9:11	Safety meeting.
9:18	Boat nav check and water level.
9:52	Anchored over first probe location; begin probing.
13:25	Haul up anchors; suspend probing for the day; tide falling.
13:42	Drop off Brian and Pat at Nutley Ramp.
13:46	Boat nav check and water level.
14:25	Moored CPG.
14:37	Boat secured. Depart CPG.
14:53	At park to perform PM nav check.
15:04	Break down base station.
15:15	End of day.

Ops. Days: 0.9

OSI Project Manager: _____

Authorized Client Representative: _____

DAILY FIELD LOG

OCEAN SURVEYS, INC.
129 Mill Rock Rd East
OLD SAYBROOK, CT 06475
Telephone: 860-388-4631 Telefax: 860-388-5879

DATE: January 25, 2015

OSI Job #: 14ES056

Project Title/Client: Tierra Solutions, Inc.

Visitors: Brian Mikucki (Rep. of TSI)
Pat Connelly (Rep. of CDM Smith on behalf of EPA)

OSI Personnel: JRB, CLR

Equipment: Trimble 5700 Boat (220242274), Trimble 750 Base (0220176388), Trimble 750 Rover (0220363513), OSI Jet Probing System

Survey Vessel: Wildu

Predicted high-tides		*Predicted low-tides*		*Weather*			
Early	**Late**	**Early**	**Late**	**Time**	10:30	**Temp (F)**	36
12:14	n/a	6:44	19:08	**Wind**	W10	**Sky**	clear
				Sea	calm		

Transects Surveyed: 8W

Number of locations surveyed: 7

Time	Activity
7:13	At park to setup base station.
7:27	AM nav check.
7:43	At CPG prepping for underway.
7:53	Underway.
8:46	Boat nav check and water level.
8:55	Pickup Brian and Pat at Nutley Ramp.
8:59	Safety meeting.
10:03	Anchored over first probe location after waiting for tide; begin probing.
11:31	Haul up anchors; suspend probing for the day; tide falling.
11:40	Drop off Brian and Pat at Nutley Ramp.
11:48	Boat nav check and water level.
11:55	Start prepping boat for travel to ramp; back up data.
12:54	Haul boat out at Kearney Park Ramp.
14:25	At park to perform PM nav check.
14:37	Break down base station.
14:45	End of day.

Ops. Days: 0.75

OSI Project Manager: _____

Authorized Client Representative: _____

ATTACHMENT 2

FINAL PROBE TALLY

Summary Table of Probing Program

Transect	Western Pipe			Eastern Pipe		
	No. of Probes*	Date(s)	Comments	No. of Probes*	Date(s)	Comments
1	0	n/a	Transect cancelled as agreed to by USEPA during 1.15.2015 discussion on first mobilization results.	16 3	12/10/14 12/11/14	Completed required number of probes – results inconclusive.
2	5	12/16/14	Terminated completion of transect as agreed to by USEPA during 1.15.2015 discussion on first mobilization results.	5 4	12/11/14 12/12/14	Completed
3	12	01/23/15	Completed	2 7	12/15/14 01/22/15	Completed
4	0	n/a	Transect cancelled as agreed to by USEPA during 1.15.2015 discussion on first mobilization results.	0	n/a	Transect cancelled as agreed to by USEPA during 1.15.2015 discussion on first mobilization results.
5	10	01/24/15	Completed	5 6	12/15/14 01/22/15	Completed
6	6 4	01/23/15 01/24/15	Completed	1	12/12/14	Transect cancelled as agreed to by USEPA during 1.15.2015 discussion on first mobilization results.
7	0	n/a	Transect cancelled as agreed to by USEPA during 1.15.2015 discussion on first mobilization results.	10	12/14/14	Completed
8	4 7	01/24/15 01/25/15	Completed	8	12/13/14	Completion of a 9th probe at transect was cancelled as agreed to by USEPA during 1.15.2015 discussion on first mobilization results.
9	0	n/a	Transect cancelled as agreed to by USEPA during 1.15.2015 discussion on first mobilization results.	5 5	12/12/14 12/13/14	Completed
10	10	12/16/14	Completed	1 10	12/10/14 12/11/14	Completed. Probe attempt on 12/10/14 was aborted due to jet probe clogging.
11	12	12/17/14	Completed	7 2	12/14/14 12/15/14	Completed
12	12	12/17/14	Completed	6 4	12/15/14 01/22/15	Completed

* The USEPA approved Nov.2014 QAPP included nine (9) probes per transect. Based on the results of the probing from the first mobilization (Dec. 10 through Dec. 17, 2014), the number of transects and probes was modified for the second mobilization (Jan. 22 through Jan. 25, 2015). This change was discussed with, and agreed upon by, USEPA during a conference call of January 15, 2015 between Tierra, USEPA and CDM Smith.

ATTACHMENT 3

SURVEY CONTROL NETWORK
AND
DAILY NAVIGATION CHECKS

Steven D. Parent
Professional Land Surveyor
N.J. Lic: 24GS03626900
SPARENT@DPKCONSULTING.NET

date

In consideration of the mutual covenants between the client listed above and the undersigned, I declare that this plan is based on a field survey made under my direct supervision on the date listed above and to the best of my professional knowledge, information and belief, correctly represents the conditions found on the date of the survey, except easements, if any, below and/or above the surface of the lands and not visible. Underground utilities and/or determination of environmentally sensitive areas were not located or made by this survey. This survey is subject to conditions which an accurate title search might disclose. This plan is made to provide relevant information to the title insurer and the mortgage holder named above. This declaration is given solely to the above named parties for this transaction only and is not transferable, except as provided herein.

Date: 08/03/14	Dr.: D.R.A.	Chk.: S.D.P.	SCALE: 1" = 100'	JOB No. 14-6260	Dwg: 14-6260TP

DPK CONSULTING
147 Union Ave, Ste. 1C, Middlesex, NJ 08846 **P: 732-764-0100** F: 732-764-0990
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

GPS CONTROL
PASSAIC RIVER PROJECT
TIERRA SOLUTIONS
350 RIVERSIDE AVENUE – LYNDHURST PARK
TOWNSHIP OF LYNDHURST
BERGEN COUNTY, NEW JERSEY

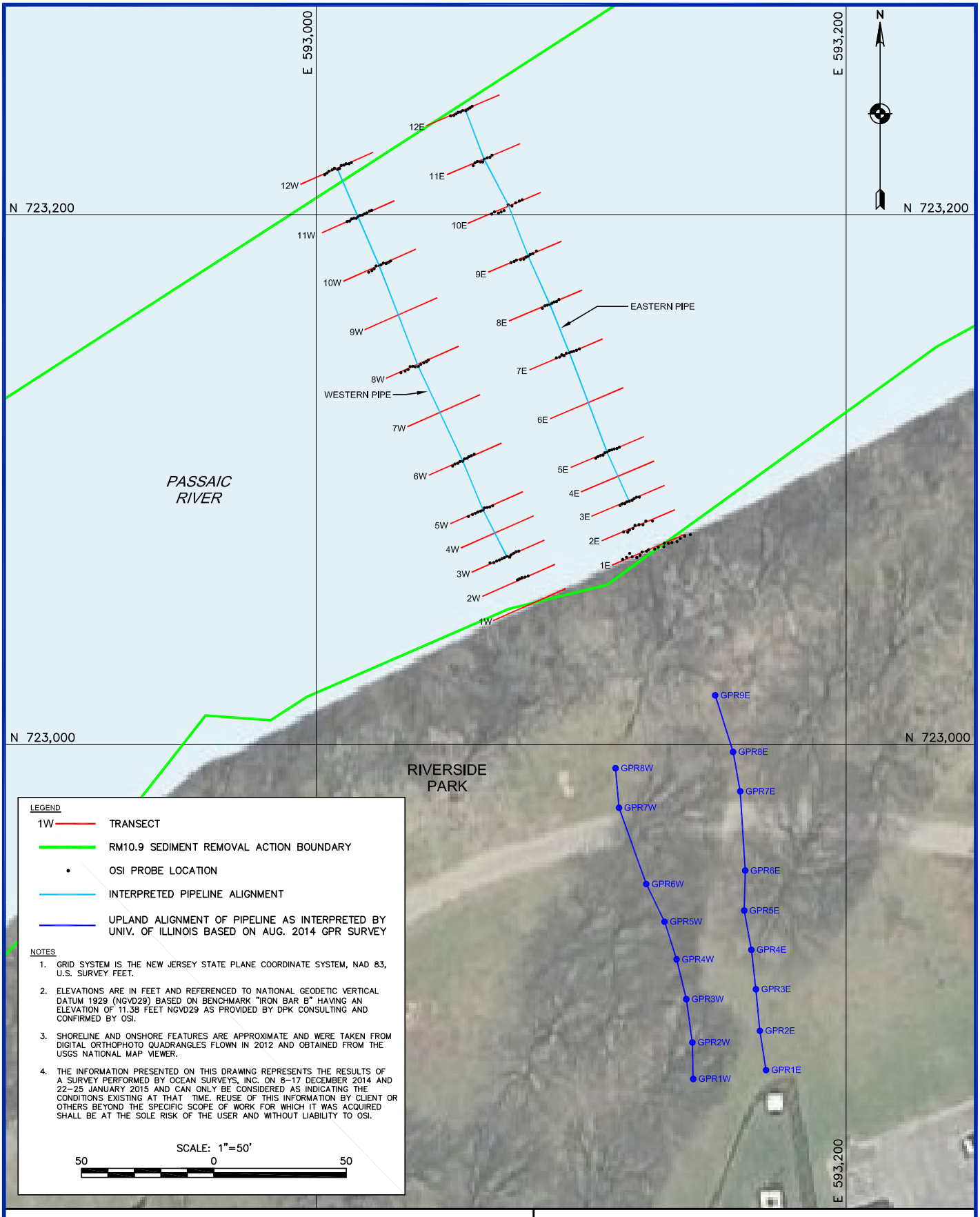
Tabulation Project Navigation Checks											
Date	Time		Station	Published Coordinates*			Observed Coordinates*			Delta XY (ft)	Delta Z (ft)
	UTC	Local		Easting (ft)	Northing (ft)	Elevation* (ft)	Easting (ft)	Northing (ft)	Elevation* (ft)		
12/08/14	18:34	13:34	MAG NAIL 'A'	593586.35	723347.55	7.07	593586.29	723347.56	7.10	0.06	0.03
12/08/14	18:38	13:38	IRON BAR 'C'	593603.47	723248.24	10.87	593603.41	723248.31	10.82	0.09	-0.05
12/08/14	19:00	14:00	IRON BAR 'D'	593224.84	722876.36	8.51	593224.92	722876.35	8.51	0.08	0.00
12/08/14	20:45	15:45	IRON BAR 'C'	593603.47	723248.24	10.87	593603.44	723248.17	10.88	0.08	0.01
12/10/14	12:20	7:20	IRON BAR 'C'	593603.47	723248.24	10.87	593603.49	723248.32	10.85	0.08	-0.02
12/10/14	21:22	16:22	IRON BAR 'C'	593603.47	723248.24	10.87	593603.52	723248.23	10.81	0.05	-0.06
12/11/14	12:07	7:07	IRON BAR 'C'	593603.47	723248.24	10.87	593603.37	723248.27	10.84	0.10	-0.03
12/11/14	21:45	16:45	IRON BAR 'C'	593603.47	723248.24	10.87	593603.50	723248.16	10.83	0.09	-0.04
12/12/14	12:08	7:08	IRON BAR 'C'	593603.47	723248.24	10.87	593603.54	723248.19	10.89	0.09	0.02
12/12/14	21:43	16:43	IRON BAR 'C'	593603.47	723248.24	10.87	593603.50	723248.27	10.90	0.04	0.03
12/13/14	12:20	7:20	IRON BAR 'C'	593603.47	723248.24	10.87	593603.49	723248.17	10.85	0.07	-0.02
12/13/14	21:22	16:22	IRON BAR 'C'	593603.47	723248.24	10.87	593603.47	723248.25	10.82	0.01	-0.05
12/14/14	12:08	7:08	IRON BAR 'C'	593603.47	723248.24	10.87	593603.52	723248.21	10.91	0.06	0.04
12/14/14	21:42	16:42	IRON BAR 'C'	593603.47	723248.24	10.87	593603.43	723248.19	10.84	0.06	-0.03
12/15/14	12:19	7:19	IRON BAR 'C'	593603.47	723248.24	10.87	593603.42	723248.19	10.83	0.07	-0.04

Tabulation Project Navigation Checks											
Date	Time		Station	Published Coordinates*			Observed Coordinates*			Delta XY (ft)	Delta Z (ft)
	UTC	Local		Easting (ft)	Northing (ft)	Elevation* (ft)	Easting (ft)	Northing (ft)	Elevation* (ft)		
12/15/14	21:28	16:28	IRON BAR 'C'	593603.47	723248.24	10.87	593603.43	723248.20	10.79	0.06	-0.08
12/16/14	12:12	7:12	IRON BAR 'C'	593603.47	723248.24	10.87	593603.39	723248.29	10.87	0.09	0.00
12/16/14	21:41	16:41	IRON BAR 'C'	593603.47	723248.24	10.87	593603.51	723248.31	10.77	0.08	-0.10
12/17/14	12:19	7:19	IRON BAR 'C'	593603.47	723248.24	10.87	593603.43	723248.27	10.86	0.05	-0.01
12/17/14	21:30	16:30	IRON BAR 'C'	593603.47	723248.24	10.87	593603.55	723248.28	10.82	0.09	-0.05
01/21/15	17:41	12:41	IRON BAR 'C'	593603.47	723248.24	10.87	593603.41	723248.20	10.84	0.07	-0.03
01/21/15	17:42	12:42	IRON BAR 'C'	593603.47	723248.24	10.87	593603.47	723248.22	10.93	0.02	0.06
01/22/15	11:18	6:18	IRON BAR 'C'	593603.47	723248.24	10.87	593603.46	723248.23	10.84	0.01	-0.03
01/22/15	20:19	15:19	IRON BAR 'C'	593603.47	723248.24	10.87	593603.50	723248.22	10.84	0.04	-0.03
01/23/15	11:17	6:17	IRON BAR 'C'	593603.47	723248.24	10.87	593603.46	723248.24	10.85	0.01	-0.02
01/23/15	19:26	14:26	IRON BAR 'C'	593603.47	723248.24	10.87	593603.47	723248.18	10.85	0.06	-0.02
01/24/15	12:53	7:53	IRON BAR 'C'	593603.47	723248.24	10.87	593603.46	723248.23	10.84	0.01	-0.03
01/24/15	19:57	14:57	IRON BAR 'C'	593603.47	723248.24	10.87	593603.46	723248.24	10.86	0.01	-0.01
01/25/15	12:26	7:26	IRON BAR 'C'	593603.47	723248.24	10.87	593603.43	723248.22	10.86	0.04	-0.01
01/25/15	19:24	14:24	IRON BAR 'C'	593603.47	723248.24	10.87	593603.44	723248.22	10.85	0.04	-0.02

*Coordinates are in the New Jersey NAD83 State Plane Coordinate System and are in U.S. Survey Feet. Elevations are in feet and referenced to NGVD 29.

ATTACHMENT 4

SEDIMENT PROBING RESULTS



LEGEND

- 1W — TRANSECT
- RM10.9 SEDIMENT REMOVAL ACTION BOUNDARY
- OSI PROBE LOCATION
- INTERPRETED PIPELINE ALIGNMENT
- UPLAND ALIGNMENT OF PIPELINE AS INTERPRETED BY UNIV. OF ILLINOIS BASED ON AUG. 2014 GPR SURVEY

NOTES

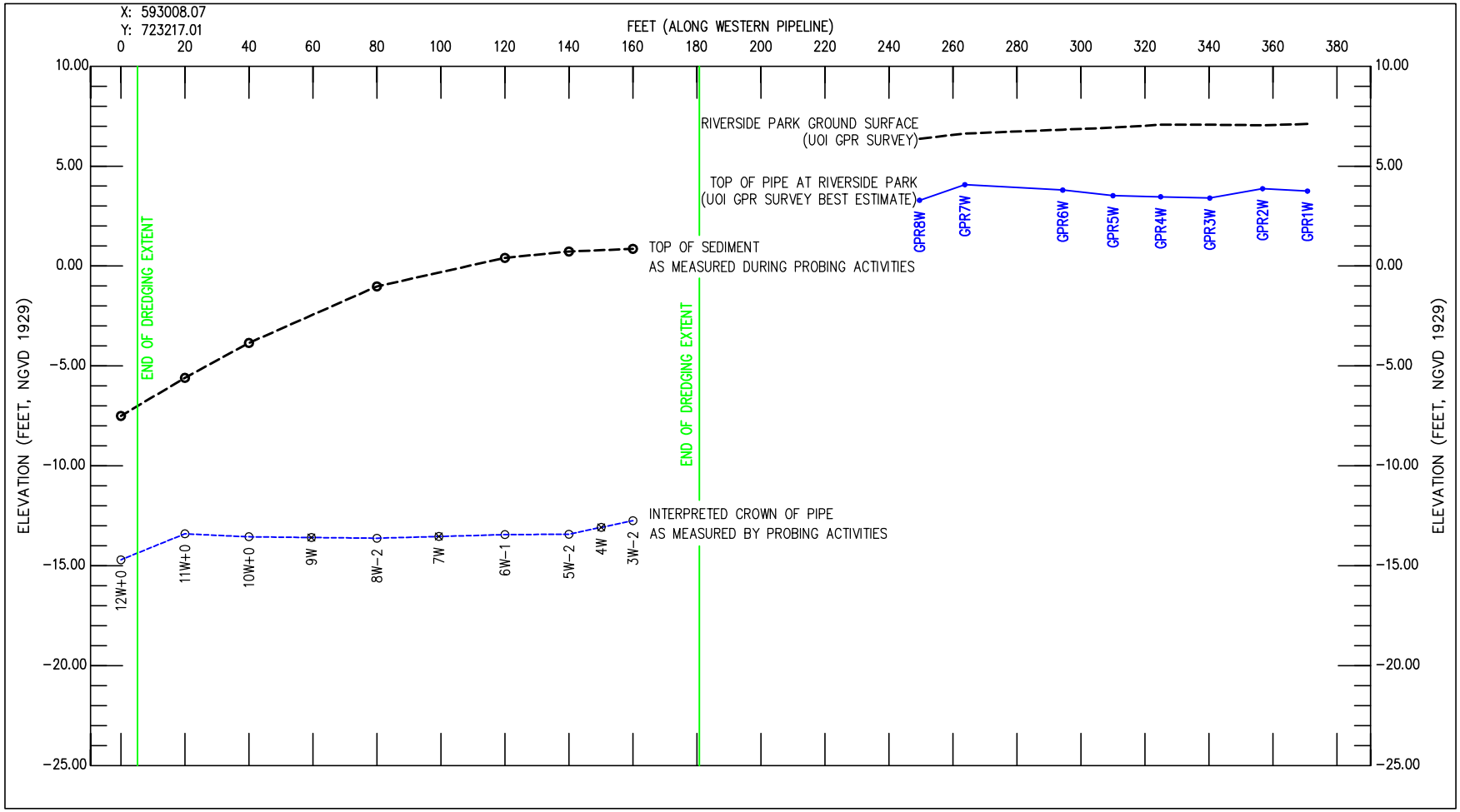
1. GRID SYSTEM IS THE NEW JERSEY STATE PLANE COORDINATE SYSTEM, NAD 83, U.S. SURVEY FEET.
2. ELEVATIONS ARE IN FEET AND REFERENCED TO NATIONAL GEODETIC VERTICAL DATUM 1929 (NGVD29) BASED ON BENCHMARK "IRON BAR B" HAVING AN ELEVATION OF 11.38 FEET NGVD29 AS PROVIDED BY DPK CONSULTING AND CONFIRMED BY OSI.
3. SHORELINE AND ONSHORE FEATURES ARE APPROXIMATE AND WERE TAKEN FROM DIGITAL ORTHOPHOTO QUADRANGLES FLOWN IN 2012 AND OBTAINED FROM THE USGS NATIONAL MAP VIEWER.
4. THE INFORMATION PRESENTED ON THIS DRAWING REPRESENTS THE RESULTS OF A SURVEY PERFORMED BY OCEAN SURVEYS, INC. ON 8–17 DECEMBER 2014 AND 22–25 JANUARY 2015 AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS EXISTING AT THAT TIME. REUSE OF THIS INFORMATION BY CLIENT OR OTHERS BEYOND THE SPECIFIC SCOPE OF WORK FOR WHICH IT WAS ACQUIRED SHALL BE AT THE SOLE RISK OF THE USER AND WITHOUT LIABILITY TO OSI.

SCALE: 1"=50'

50 0 50

OCEAN SURVEYS, INC.
OLD SAYBROOK, CONNECTICUT
(860) 388-4631
www.oceansurveys.com

SEDIMENT PROBE TRANSECT OVERVIEW
SUBMARINE PIPELINE CROSSING, RM 10.9
PASSAIC RIVER, NJ



LEGEND:

8W-2 ○ TRANSECT LOCATION COMPLETED

9W ⊗ TRANSECT LOCATION NOT COMPLETED

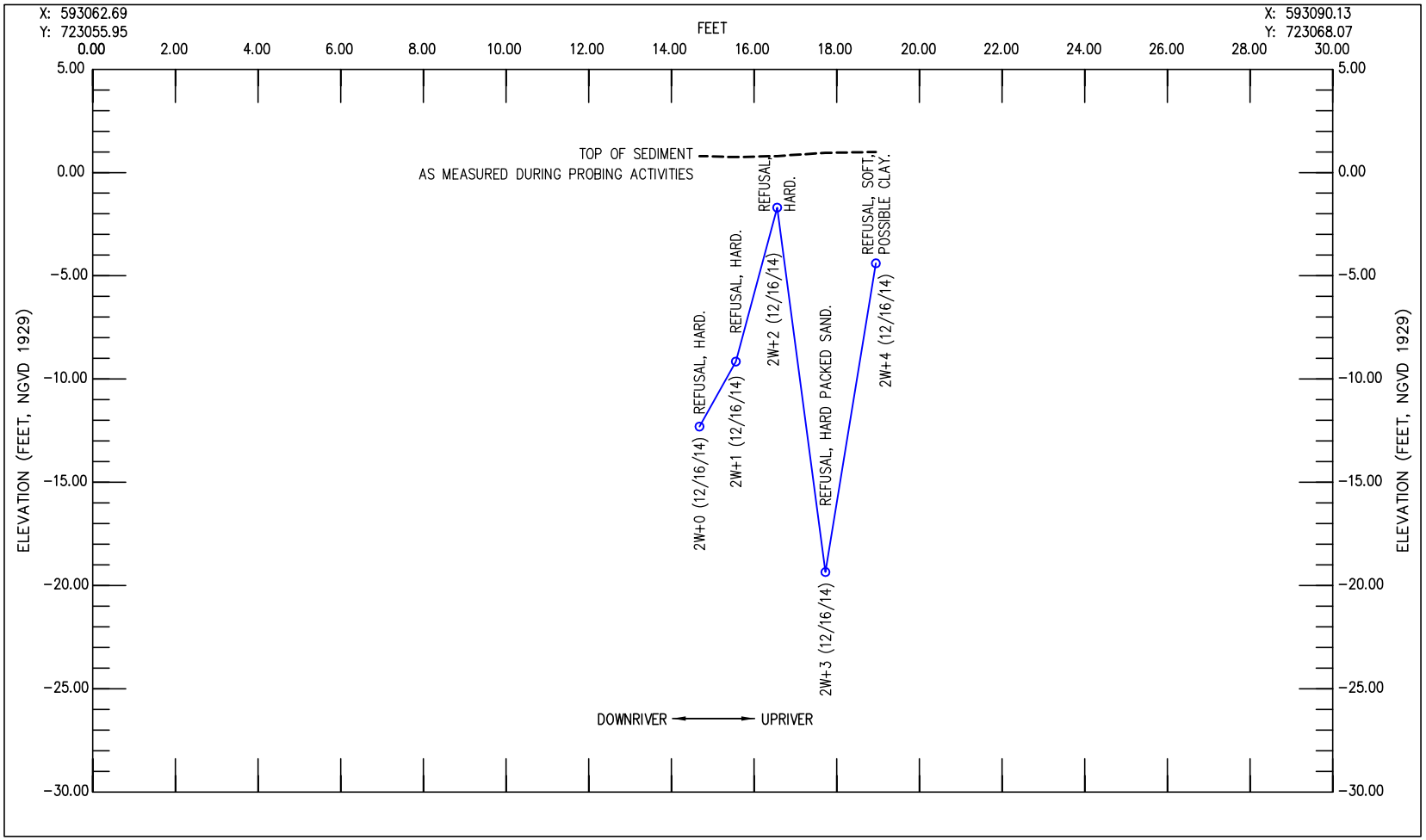
OCEAN SURVEYS, INC.

OLD SAYBROOK, CONNECTICUT

(860) 388-4631

www.oceansurveys.com

Sediment Probes Along West Alignment
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



NOTE:

PROBING WAS NOT ABLE TO CONFIDENTLY IDENTIFY PIPE LOCATION DUE TO NEAR SHORE OBSTRUCTIONS.

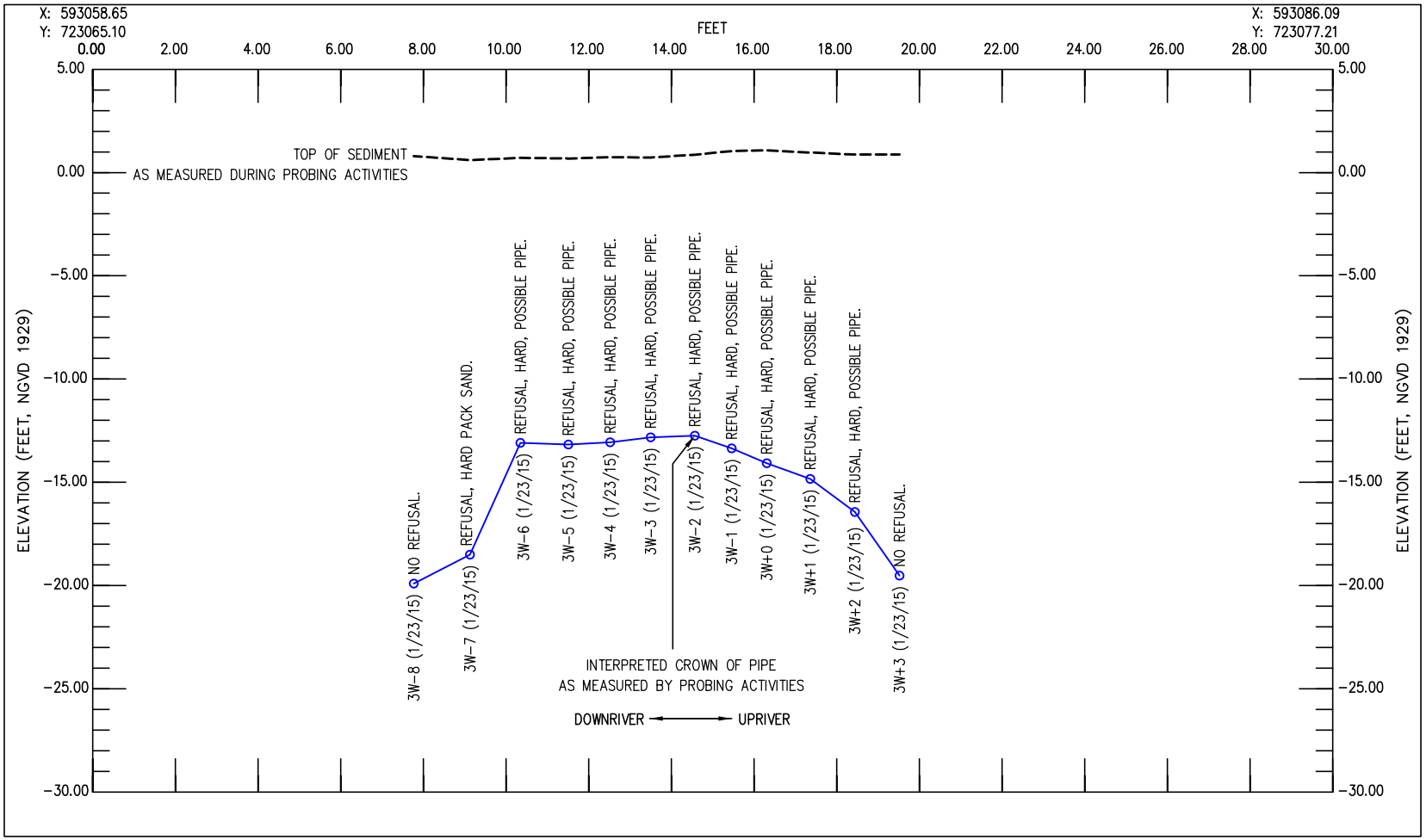
OCEAN SURVEYS, INC.

OLD SAYBROOK, CONNECTICUT

(860) 388-4631

www.oceansurveys.com

Sediment Probe Transect 2W
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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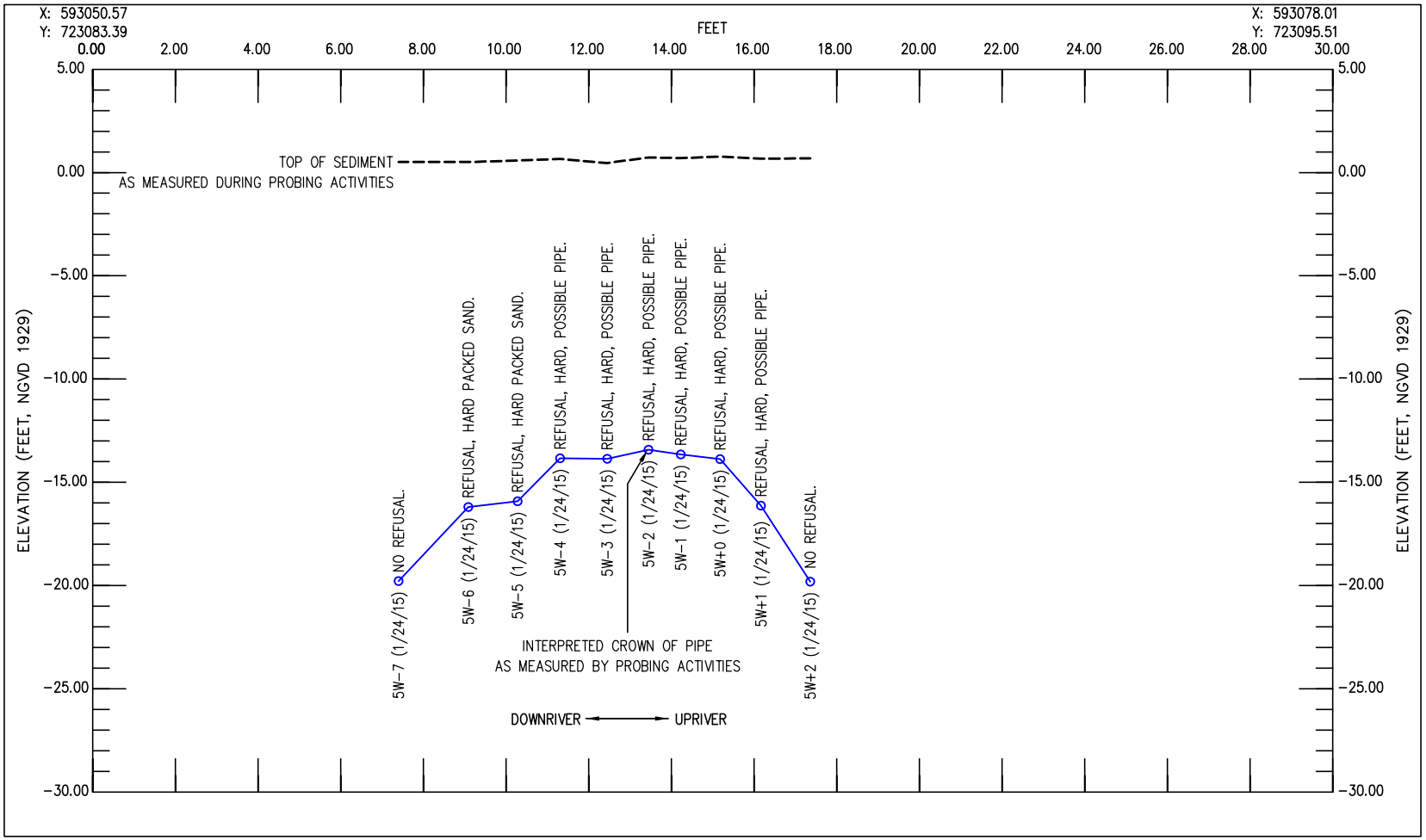
OLD SAYBROOK, CONNECTICUT
(860) 388-4631
www.oceansurveys.com

Sediment Probe Transect 3W
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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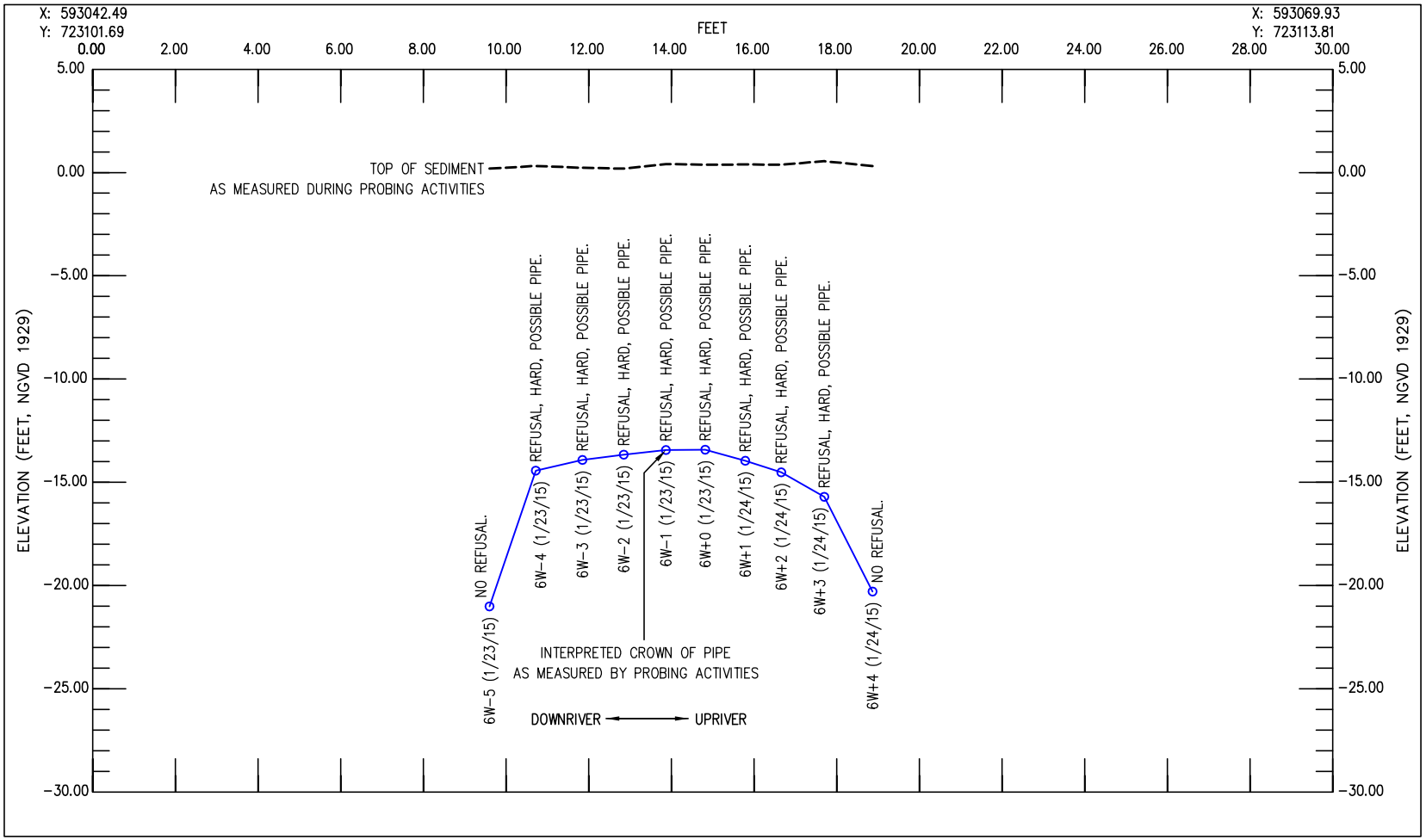
Sediment Probe Transect 5W
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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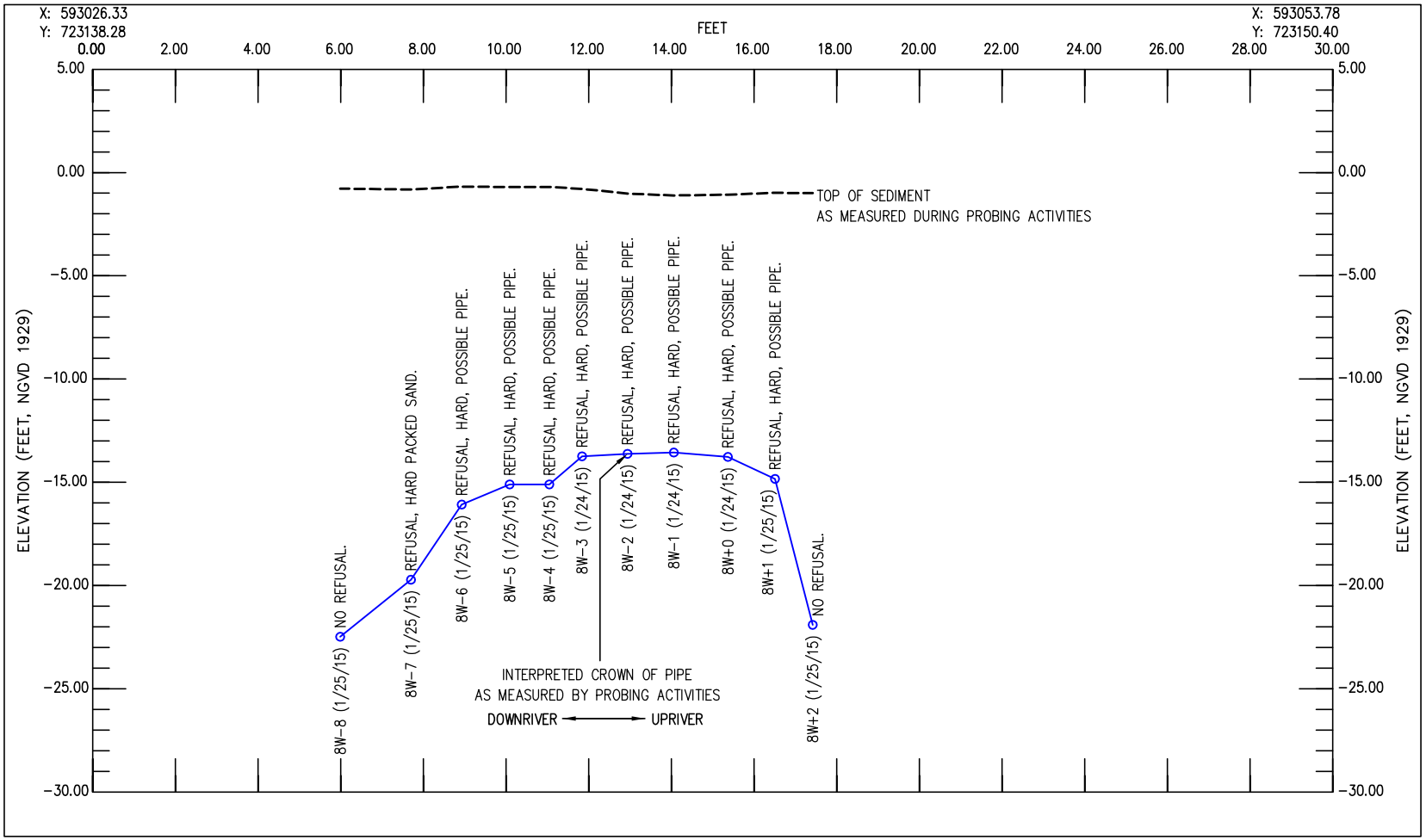
Sediment Probe Transect 6W
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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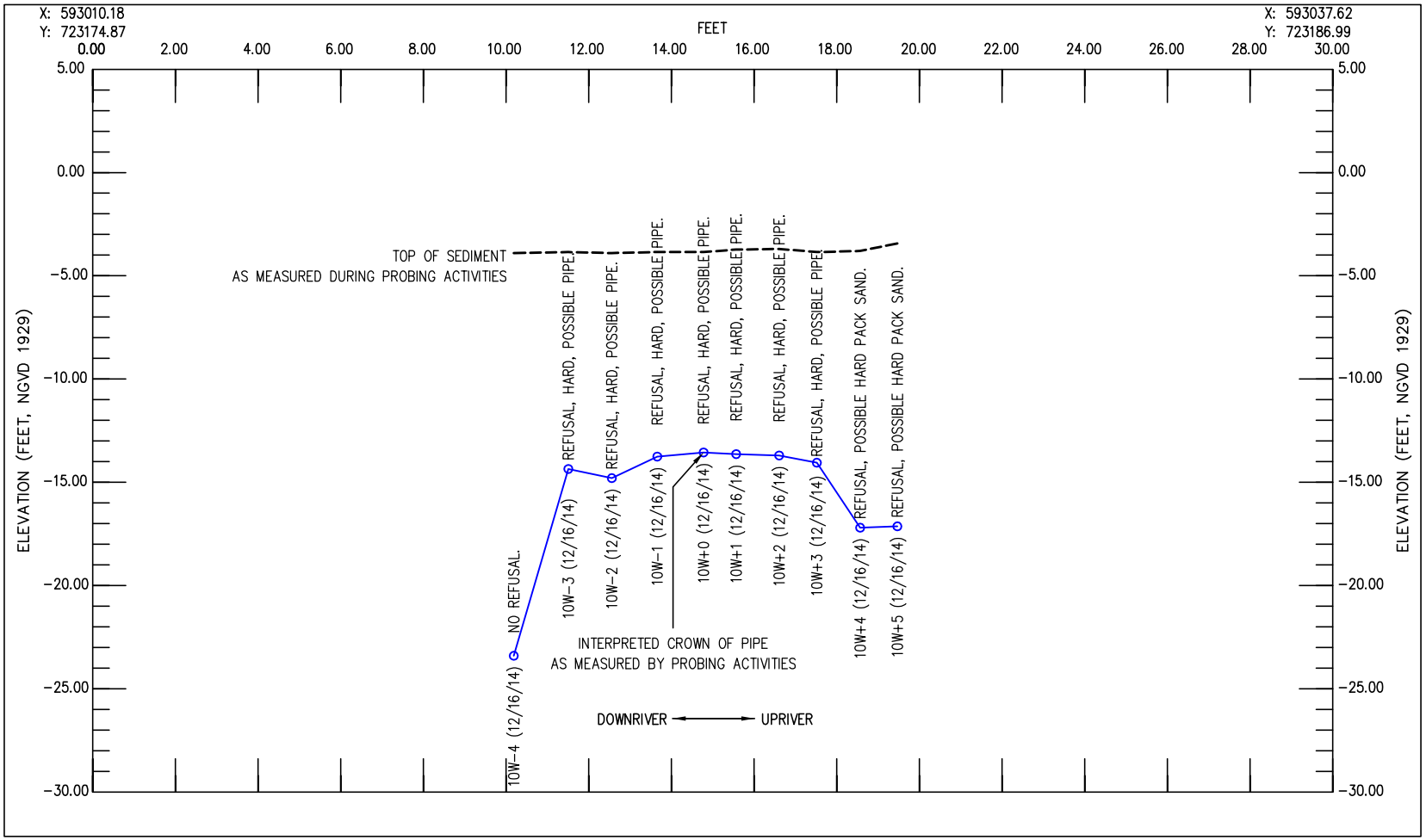
Sediment Probe Transect 8W
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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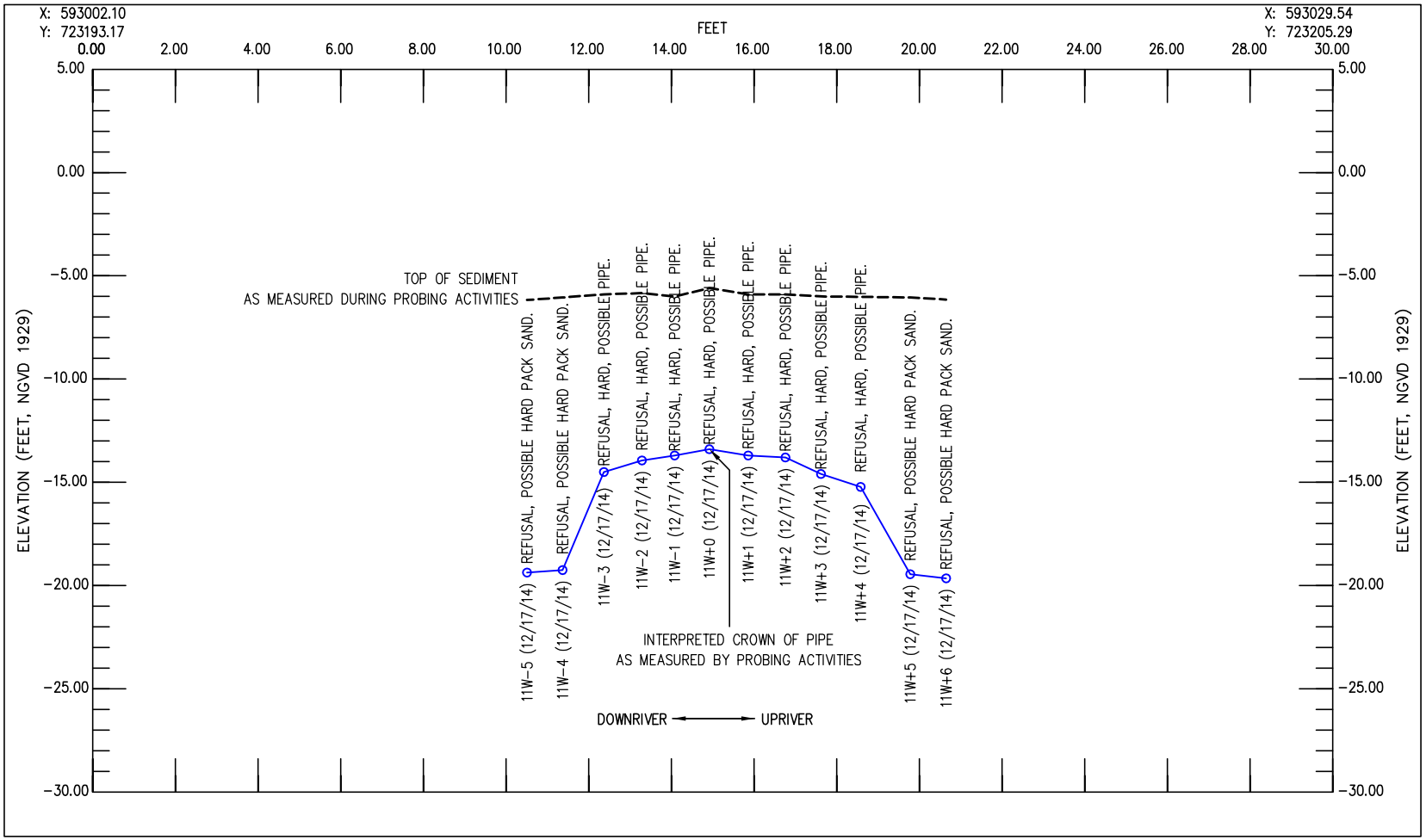
Sediment Probe Transect 10W
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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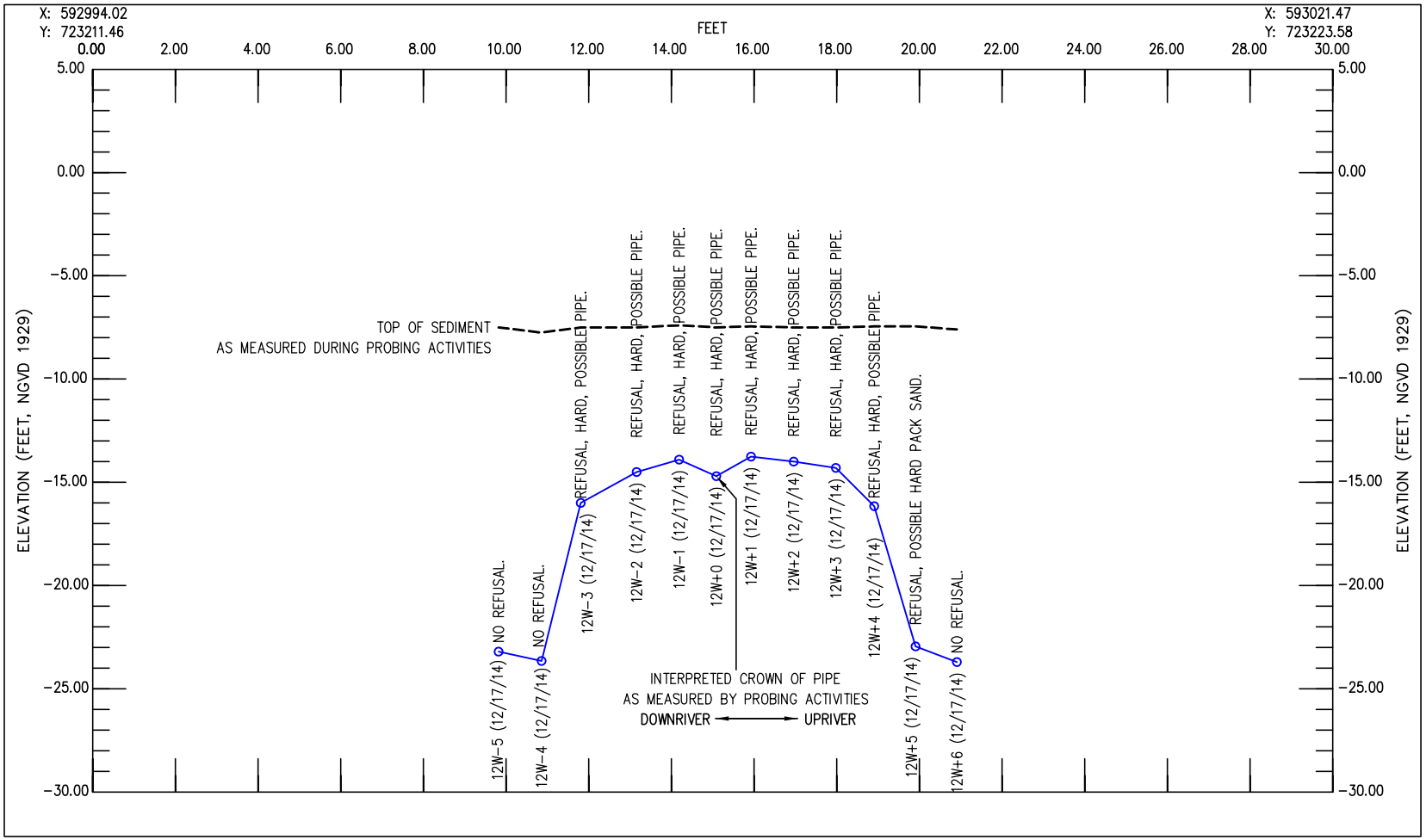
Sediment Probe Transect 11W
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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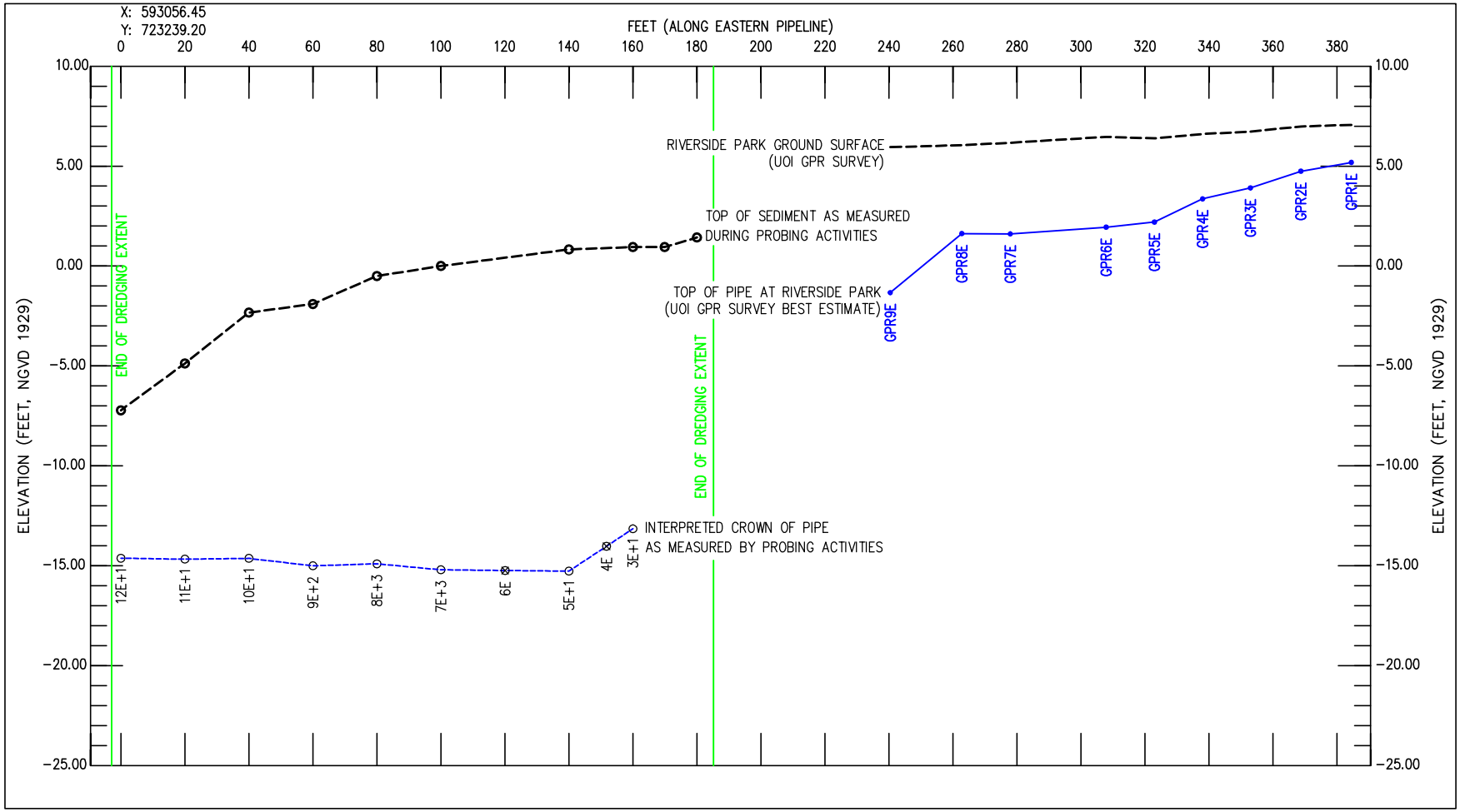
Sediment Probe Transect 12W
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



LEGEND:

8E+3 ○ TRANSECT LOCATION COMPLETED

6E ⊗ TRANSECT LOCATION NOT COMPLETED

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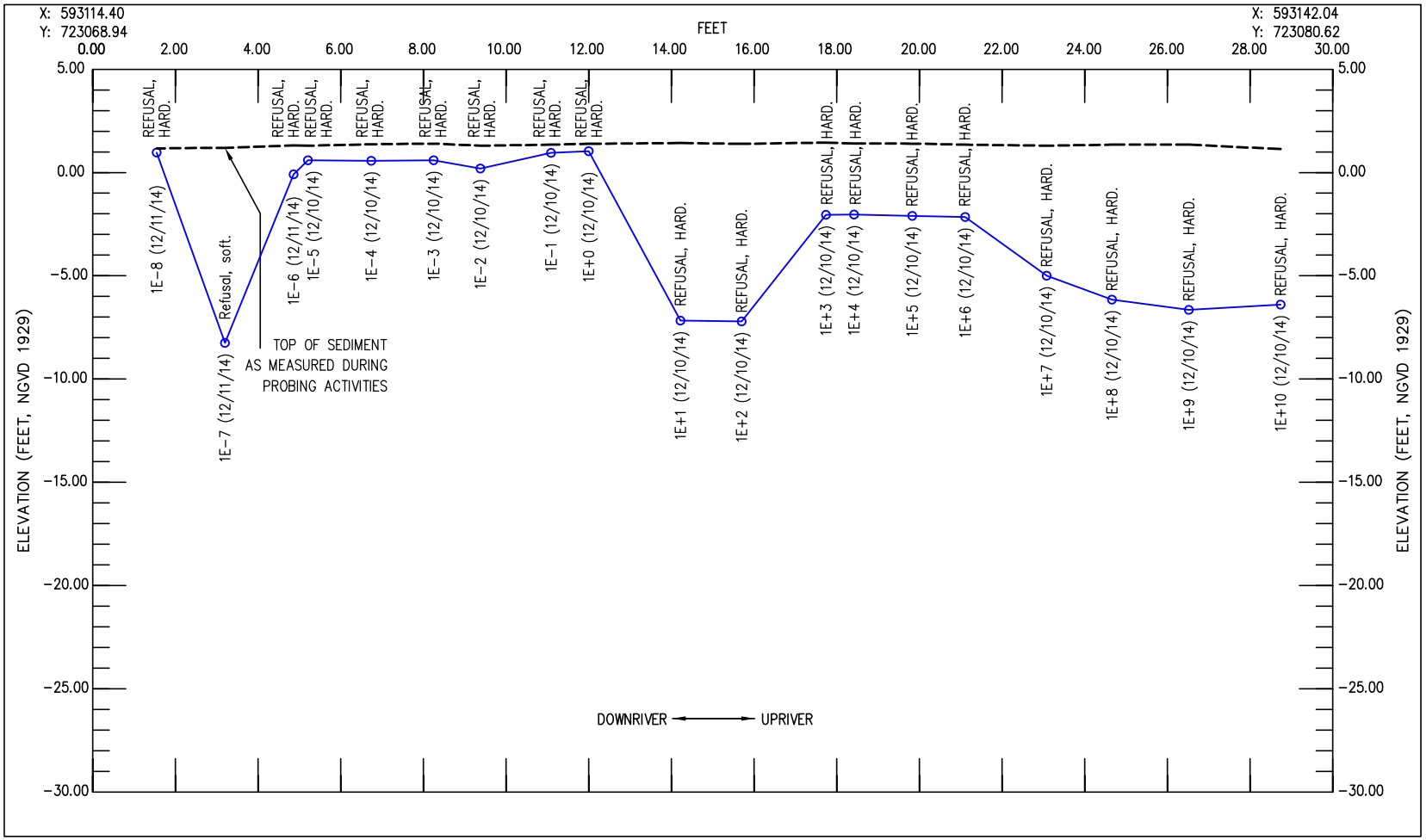
Sediment Probes Along East Alignment
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



NOTE:

PROBING WAS NOT ABLE TO CONFIDENTLY IDENTIFY PIPE LOCATION DUE TO NEAR SHORE OBSTRUCTIONS.

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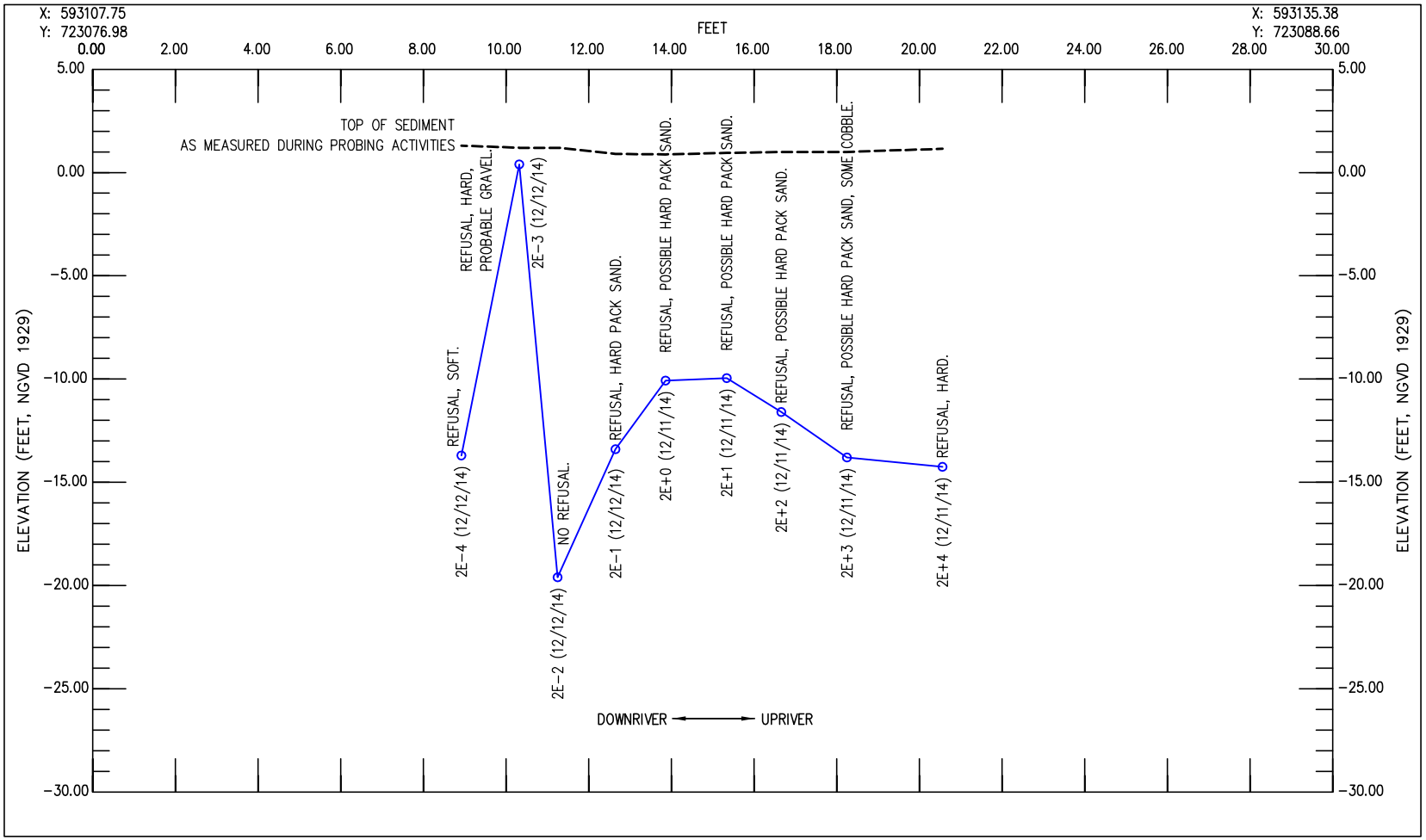
Sediment Probe Transect 1E
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



NOTE:

PROBING WAS NOT ABLE TO CONFIDENTLY IDENTIFY PIPE LOCATION DUE TO NEAR SHORE OBSTRUCTIONS.

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Sediment Probe Transect 2E
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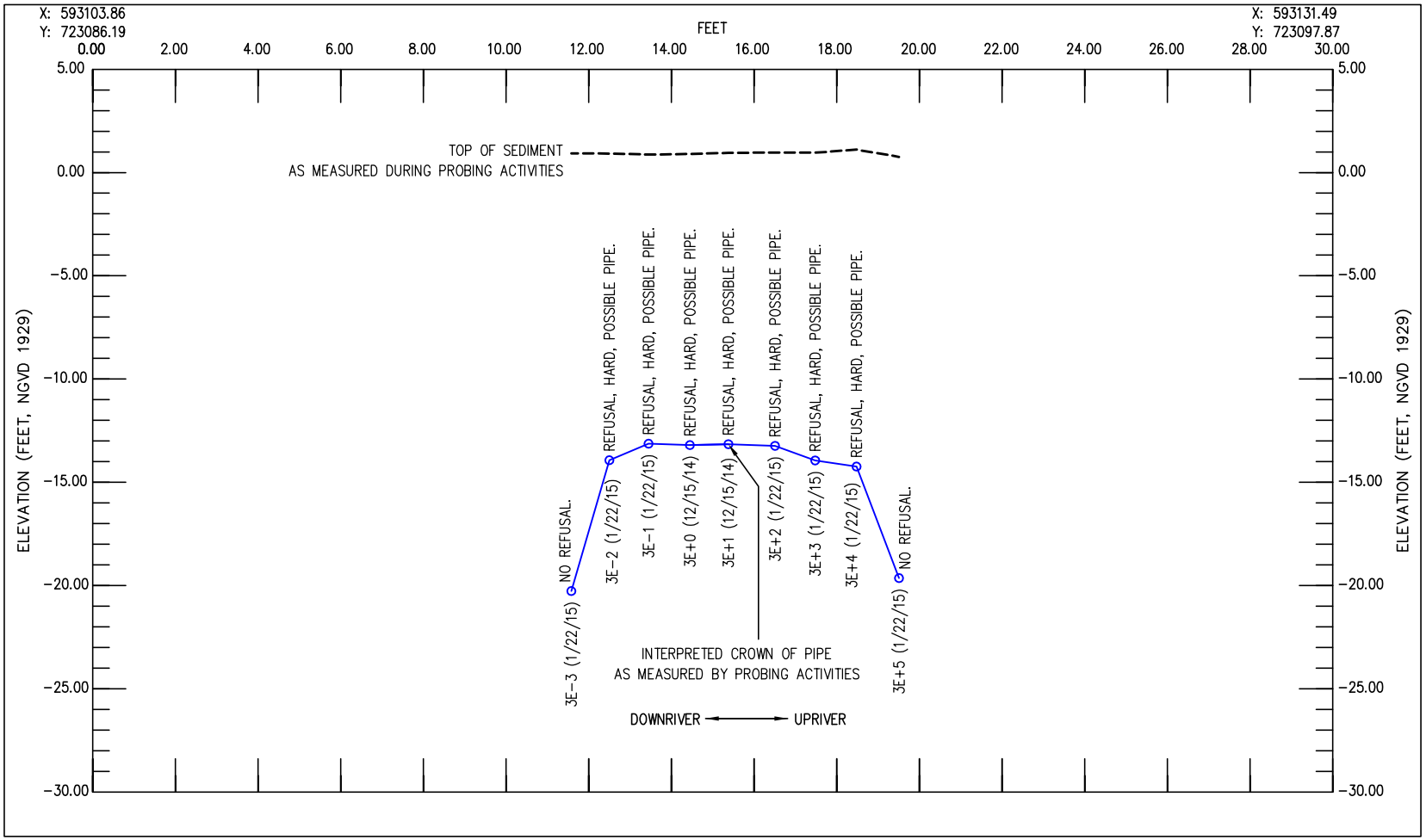

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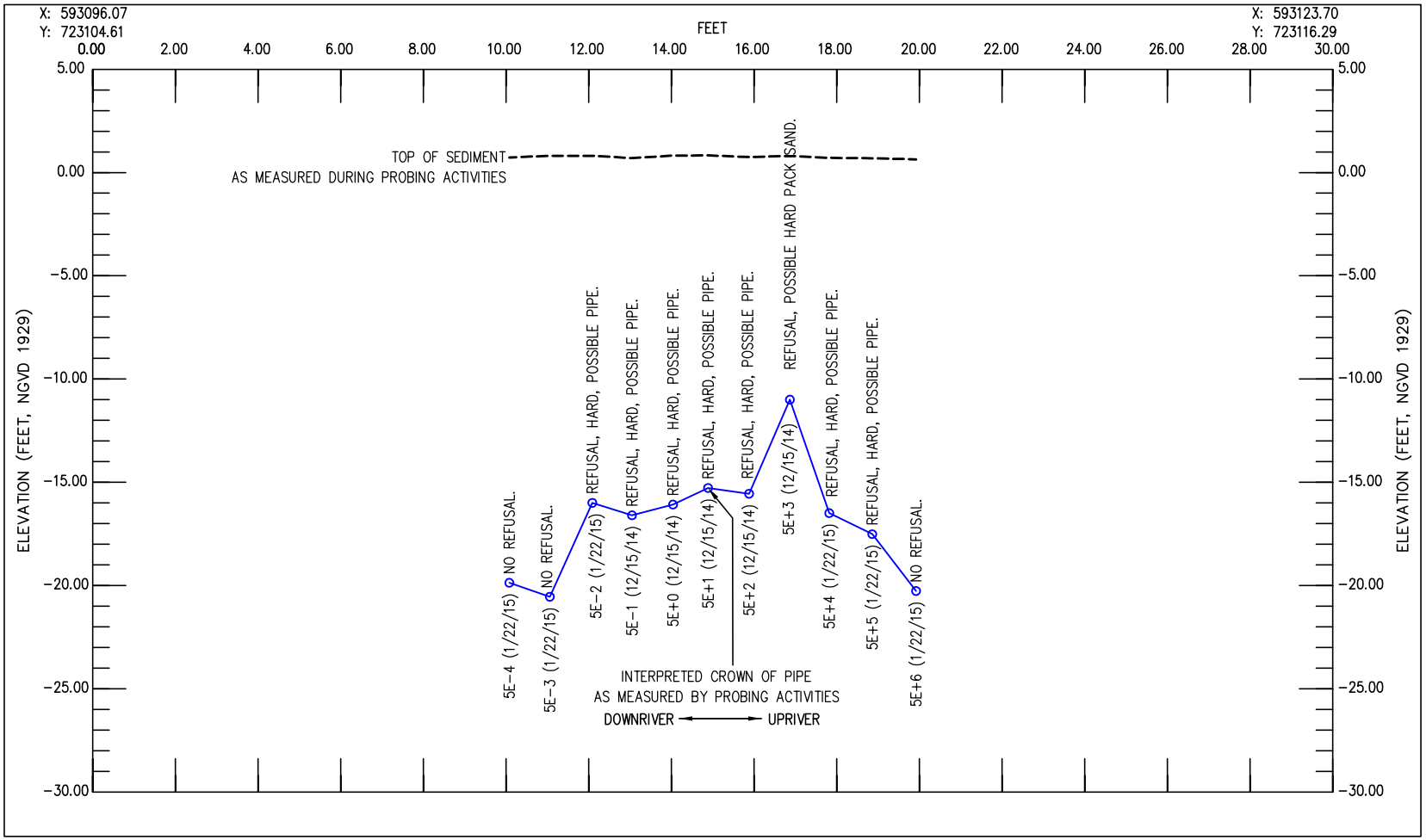
Sediment Probe Transect 3E
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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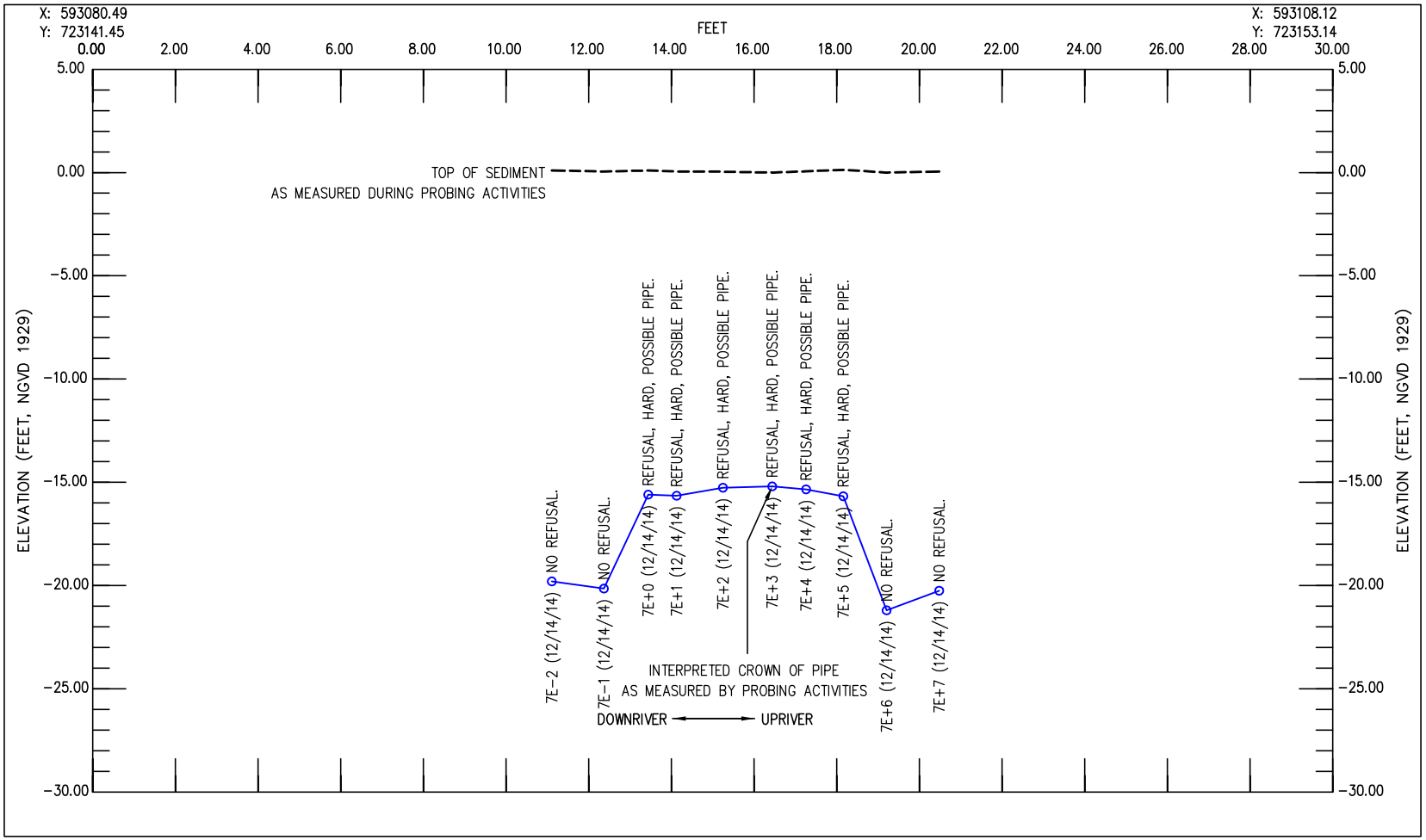
Sediment Probe Transect 5E
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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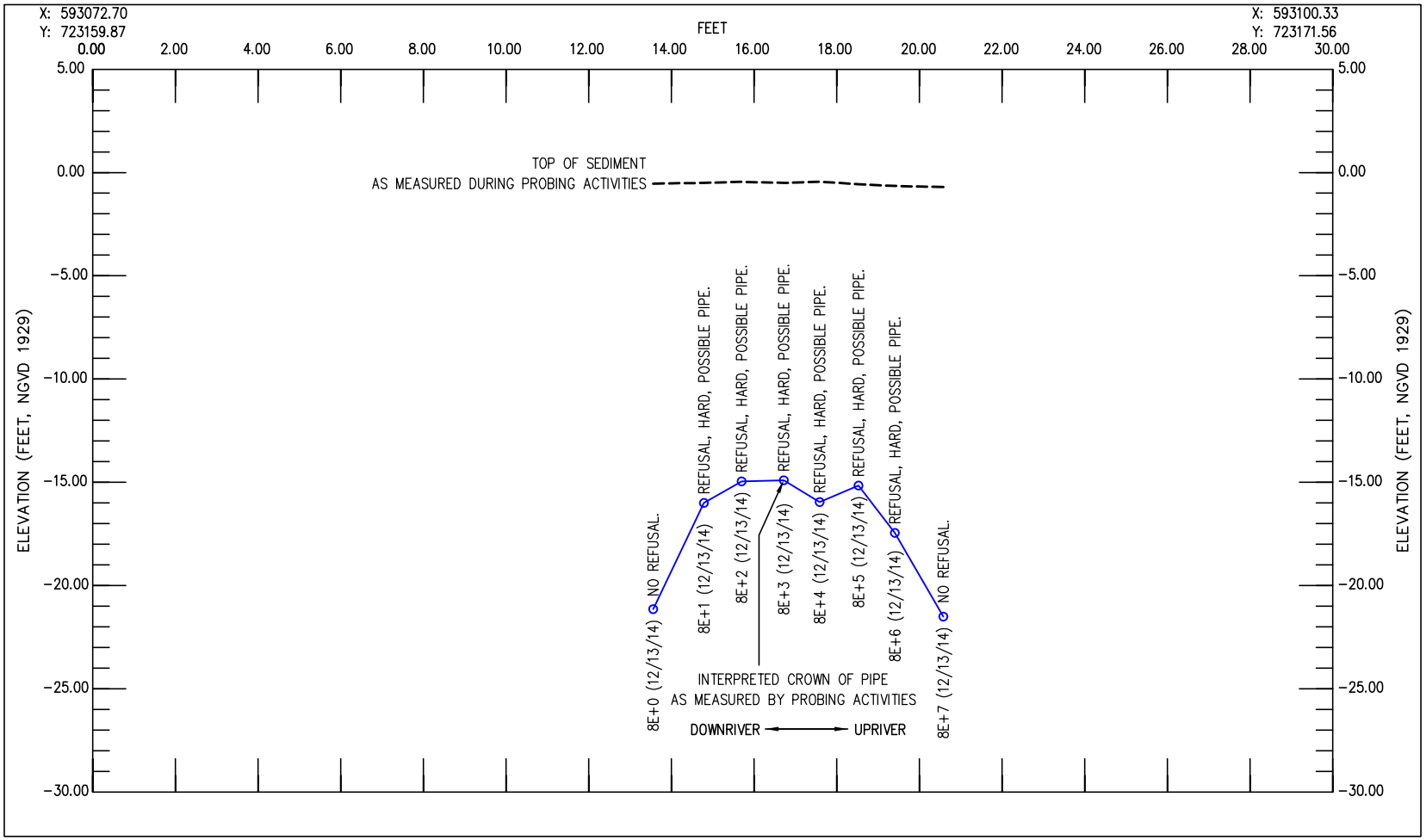
Sediment Probe Transect 7E
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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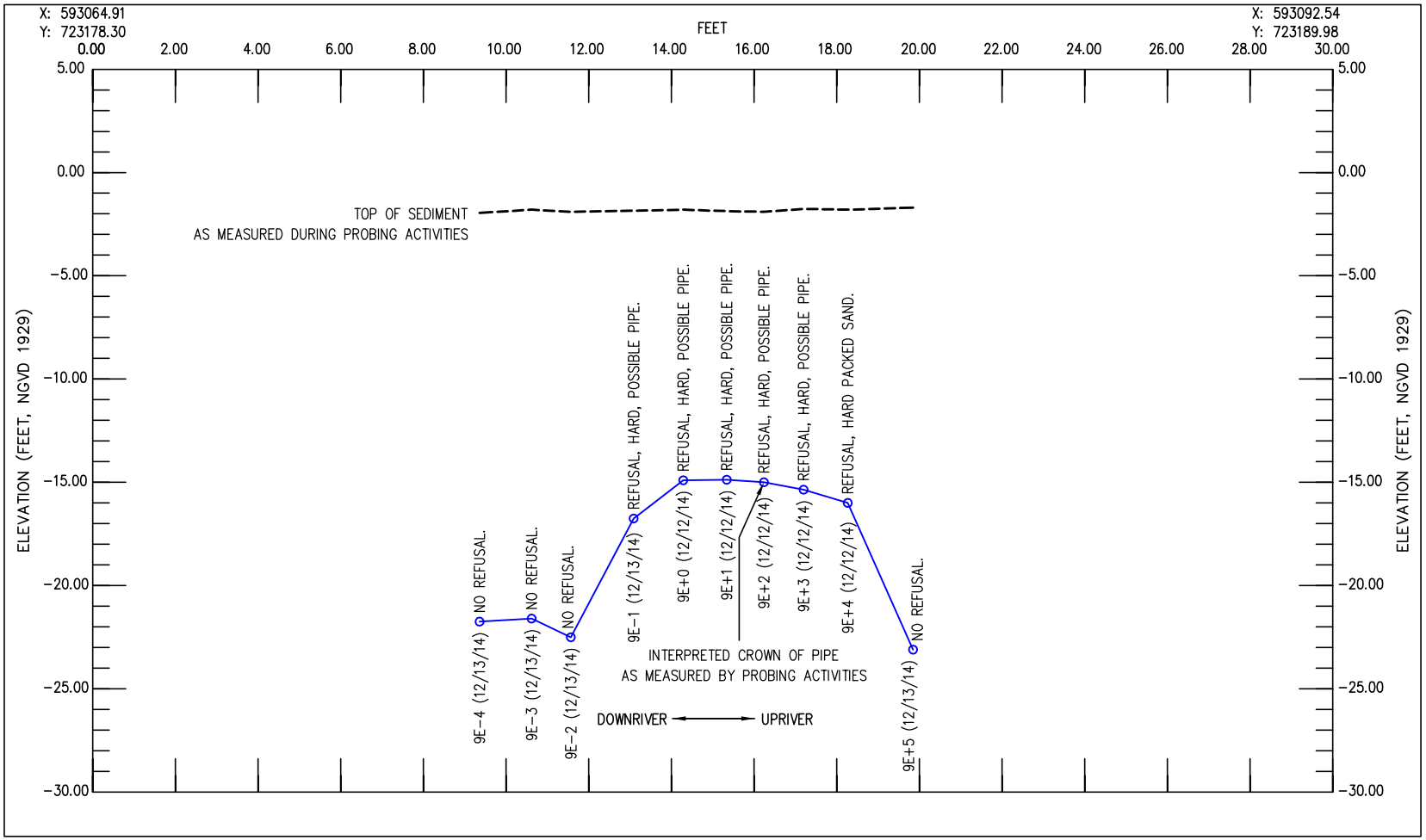
Sediment Probe Transect 8E
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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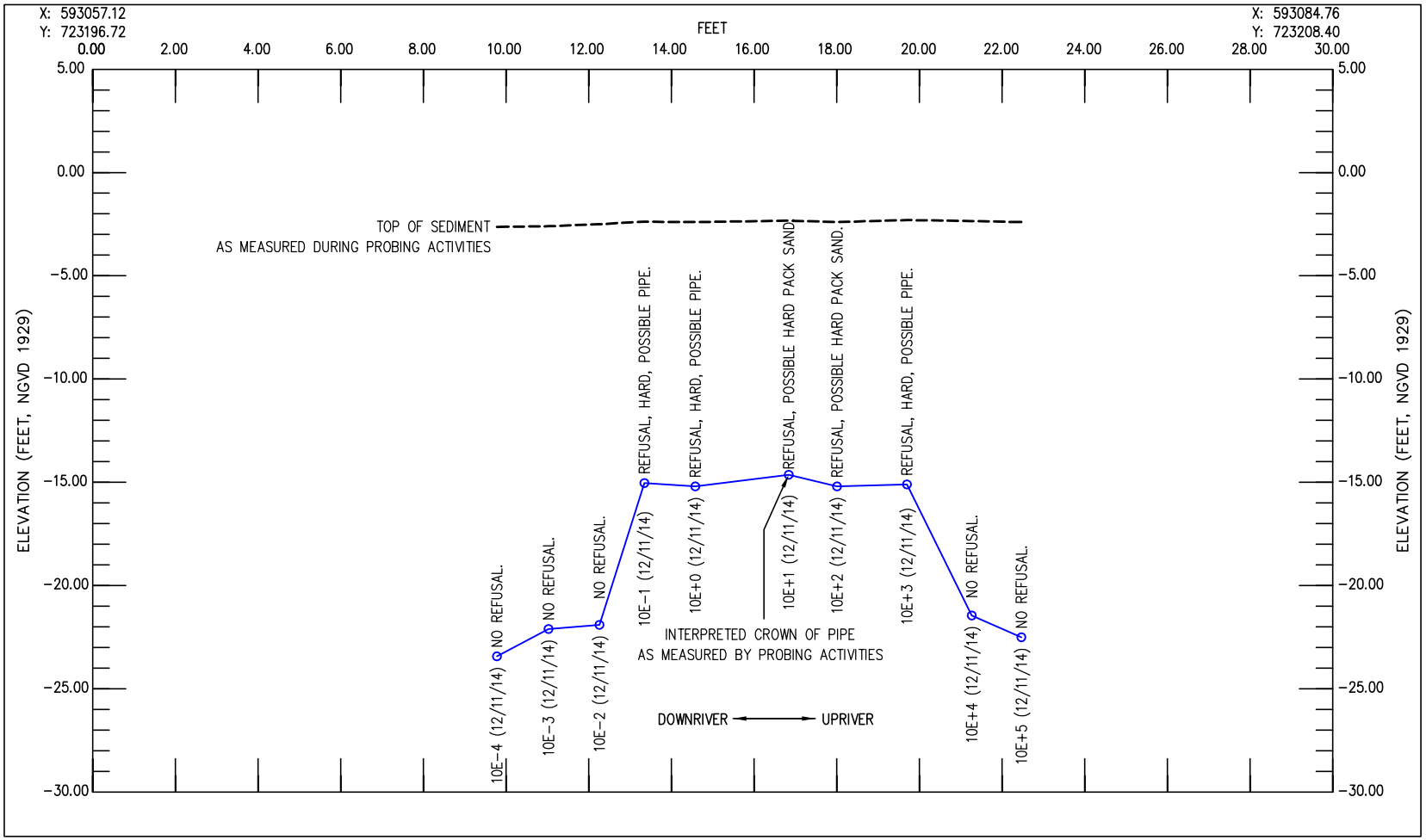
Sediment Probe Transect 9E
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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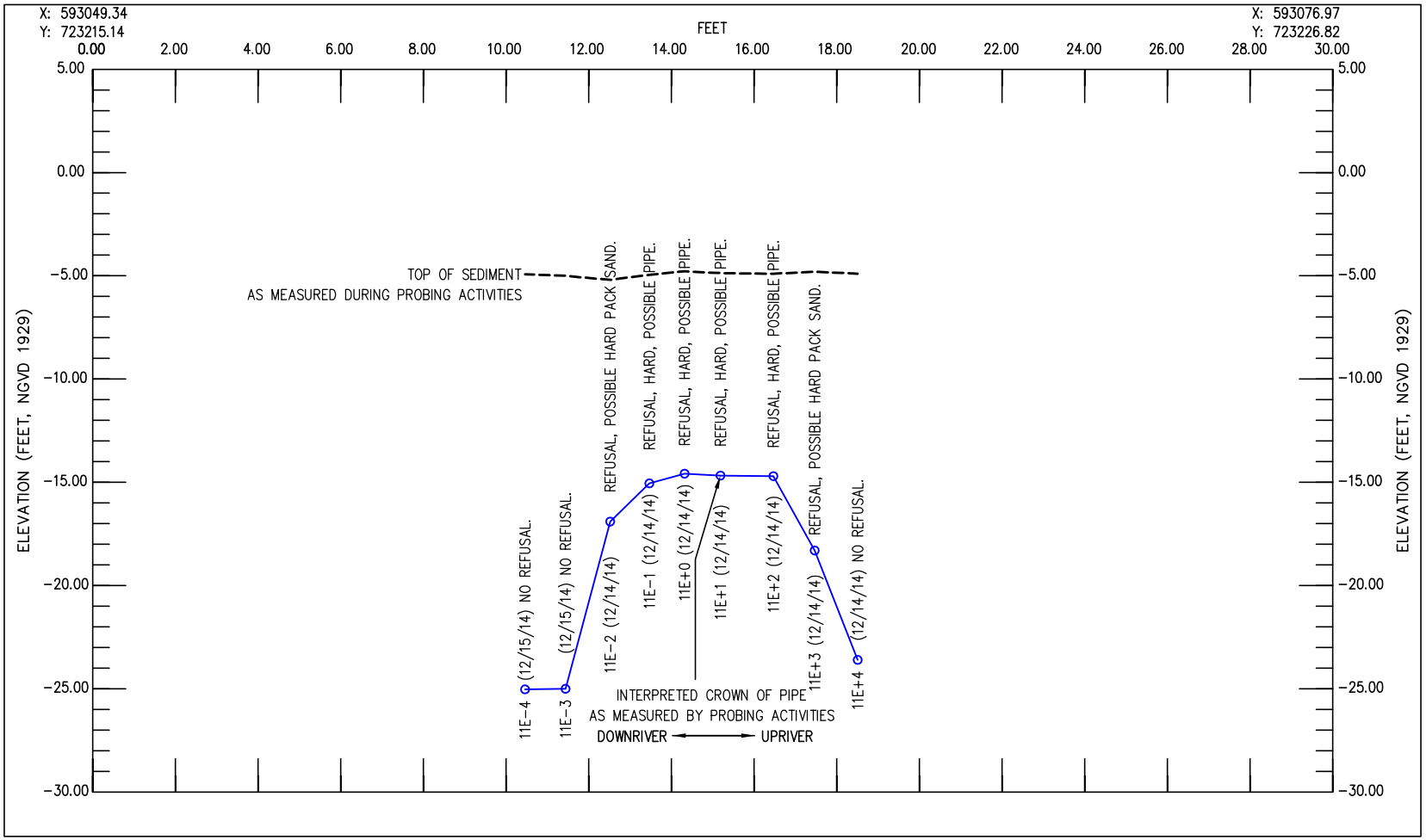
Sediment Probe Transect 10E
Submarine Pipeline Crossing, RM 10.9
Passaic River, New Jersey



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Sediment Probe Transect 11E
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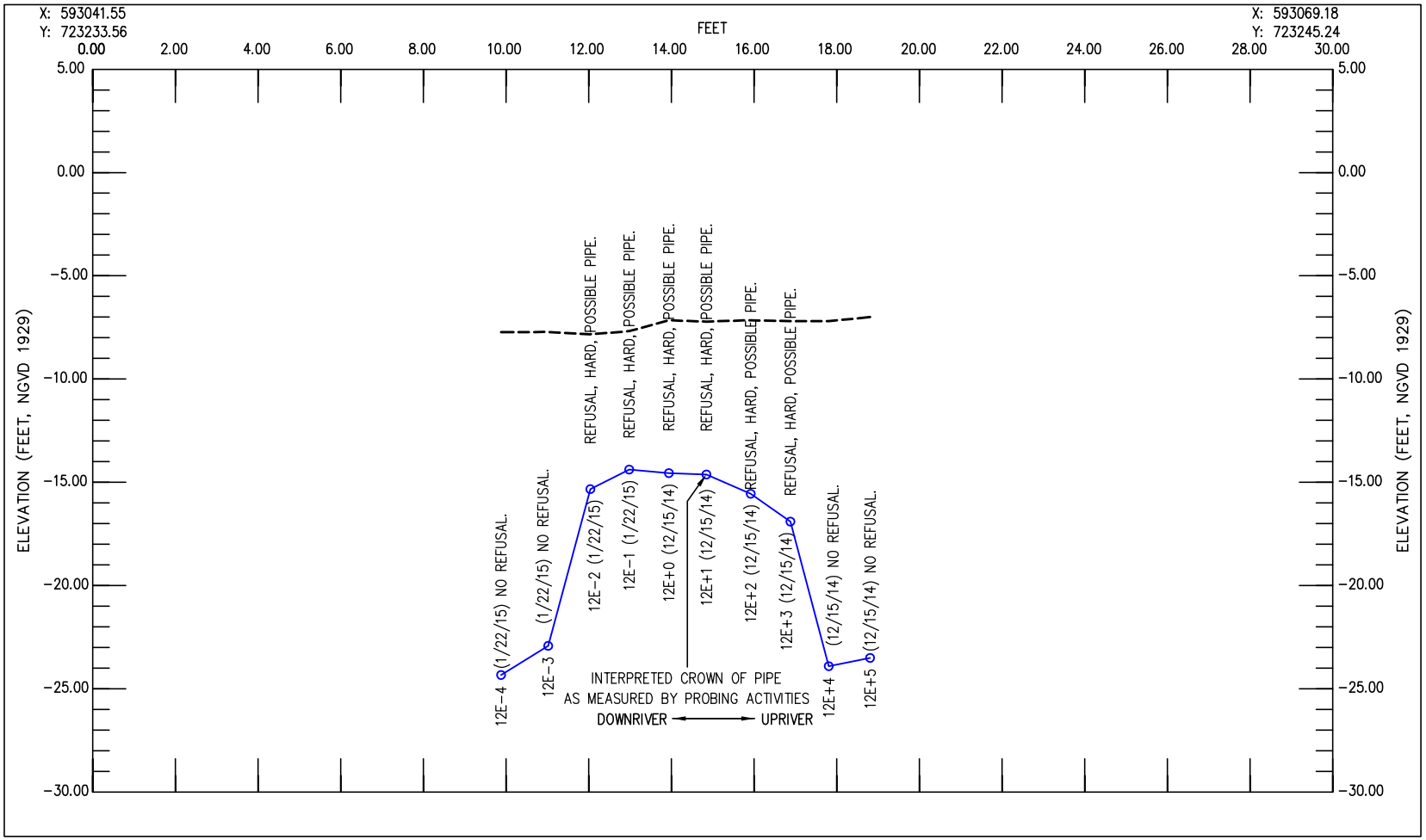

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